

ACID EFFECT
SECOND COLUMN

FILE



JANUARY 3, 1966

INVEST

B 1/10

NOTES 1/3/66 BALCH
9/28/63

S-II-T Work is proceeding as scheduled and forward skirt should be replaced January 3, weather permitting. Five-inch Hg vacuum was pulled on sidewall insulation so the repairs to insulation may begin January 3. Review of S&ID open work on GSE is as follows:

	<u>Dec. 17</u>	<u>Report of</u> <u>Dec. 27</u>
Total Shortages	599	401
Total Field Test Work Sheets	329	327
Total Squawks	426	428
Total Parts Removals*	83	99
Total Configuration Change Records	<u>1568</u>	<u>537</u>
Grand Total	3005	2792
Total Items to Be Worked:		
Prior to Static Firing	2349	2213
After Static Firing	656	579

*Only those parts that have been removed and not replaced or have had no re-test.

No new information on Stage. ✓

B_{1/10}

1/3 JB

H-1 ENGINE Damage was sustained by the H-1/Atlas braze furnace at Canoga on December 28, 1965. The bell of the furnace dropped from a height of about 5 feet during a normal production operation and struck both furnace bases. The bell suffered moderate damage and the bases were subjected to minor damage which will require approximately six weeks to repair.

Rocketdyne is preparing a detailed estimate for repair and a recovery schedule for thrust chamber production. The impact on engine delivery schedules will be determined after review of the Rocketdyne study. ✓

F-1 ENGINE Turbine mainfold shroud failure on the green-run test of turbopump E-2030 has resulted in an interim return to the three piece shroud. As this shroud is a six week lead-time item, late engine deliveries for S-IC-4 are estimated as follows: F-5029 three weeks, F-5030 two weeks and F-5031 one week.

Engine F-4028 arrived at MSFC on December 27, 1965, and has been designated as the spare engine for S-IC-2.

Incentive conversion negotiation of the deliverable hardware contract NAS8-5604 will reconvene at MSFC on January 5, 1965, for last-ditch effort to obtain agreement during the first week of January. ✓

RL10 ENGINE Engine FX-150 which incorporates the weight saving performance improvement features has successfully completed 9 firings of the 20 firing endurance substantiation.

In accordance with information from you on December 28 that the RL10 will not be transferred to LeRC, we are proceeding through Harry Gorman with the delegation of resident Quality Control (inspection) and contract administration services at P&W to DOD's DCSA (Defense Contract Service Administration). ✓

The last prototype RL10A3-3 engine was delivered on December 27, 1965. Delivery of production RL10A3-3 engines will begin in May 1966. ✓

J-2 ENGINE A presentation of the plan for converting the J-2 development contract to incentive and incorporating the production contract was made to NASA Headquarters personnel on Tuesday, December 28, 1965. Included in this presentation was the incentive plan for the addition of a 52 engine follow-on procurement and associated services and supplies. This presentation will be made to Dr. Mueller at NASA Headquarters on January 11, 1966.

The second set of J-2 engines (FRT) was successfully fired in the S-II Battleship for 19 seconds duration of mainstage on December 29. ✓ This was the first stage firing of these engines. The next test of 350 seconds duration is scheduled for January 11, 1966. ✓

NOTES 1-3-66 CLINE

NEGATIVE REPORT

9/5 1/3

B 4/10

NOTES 1/3/66 CONSTAN

B 1/10

9/13

Negative Report

NOTES 1-3-66 DANNENBERG

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1. The funding and schedule breakout for MSFC Experiment #1 has been furnished to Mr. Taylor, AA Program Office in response to his request. ✓

2. The minutes of MSFEB meeting 65-6 (11-22-65) which incorporates the Board's decision on new procedure requirements for approval of In-Flight Experiments have been received and distributed. A draft of MSFC internal procedures reflecting these changes is being circulated for review and comment. ✓

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3. The agenda for MSFEB meeting 66-1 have been received and distributed. MSFC will not have any items (experiments) ready to present at this meeting. Other presentors may require MSFC support in areas of: OART-Optical experiments; Apollo Program Office's discussion of the change of MSFC #1 to vehicles AS-205 and 206; and AA Program Office's discussion of Galactic X-Ray mapping. ✓

4. The program authority release (PAR) for \$1.6M to fund Experiments 1 thru 9, for which procurement packages are being prepared by R-P&VE, was received by R-S. ✓

5. Although "Operation Papermill" got underway only late in 1965, it has already resulted in 60 suggestions, now under evaluation. Some appear promising in regard to considerable cost savings. ✓

6. A number of documents on early ram-jet research have been located and action is being taken to have them made available for transmittal to General Dornberger. ✓

NOTES 1/3/66 GEISSLER

B 1/10

958 1/3

Saturn IB Polar Orbits: Re: your recent note to me concerning IB Polar Orbits and associated range safety (copy attached). Prior to this time we have extensively investigated the problems involved with the launch of one vehicle from KSC into a polar orbit and foresee no major problems, although the profile has not been presented to the range safety officer at ETR. At this time we are investigating the launch window problems involved with performing a rendezvous mission in a polar orbit from KSC. The problem involved is primarily one of achieving a finite launch window with minimum violation of range safety constraints. It is anticipated that these studies will be completed by the end of January. Pending study completion, we will arrange a briefing for you on this subject. ✓

B 1/10

98 1/3

SOME EFFORTS AND EVENTS OF 1965 (not regularly reported):

- a. FACI: This Laboratory was designated "lead laboratory" for R&D Operations in performing First Article Configuration Inspection (FACI). Substantial effort has been, and will continue to be, devoted in this area. ✓
- b. CONFIGURATION MANAGEMENT: An extensive effort has been made toward implementation of the NPC-500 configuration management documents. On the S-IB program, at least the intent of these documents has been implemented beginning with the S-IB-3 stage. ✓
- c. CALIBRATION: Calibration activity and capability has steadily increased during 1965. Through use of improved facilities and procedures, we have been able to increase our activity in this area without increasing manpower. There are now approximately 19,850 items on the calibration call-in list as compared with approximately 13,475 in 1964. MTF and KSC were given noteworthy support but stand on their own feet now. NASA Headquarters (MAR) has asked that we act as host for a conference on NASA Calibration Policies, tentatively scheduled for February 24-25, 1966. Participants from KSC, MTF, MSC and Michoud as well as NASA Headquarters are expected. ✓
- d. UCR: An improved Unsatisfactory Condition Report (UCR) system based on rapid collection of automated data was initiated. Progress in this area, which depends to a great extent on contract revisions, has been steady.
- e. QUALIFICATION TESTING: Qualification testing, in which we serve as "lead laboratory", was particularly successful on the S-IC stage last year. Barring future design changes, there are only two flight critical items remaining to be qualified. ✓ I attribute this progress, to a good extent, to the fact that a single point of contact for MSFC was appointed in this Laboratory approximately eight months ago. We have proposed a similar method of operation on other stages where progress is not as good, but to date have not been able to reach an agreement with the stage offices. Why? B
- f. RELIABILITY: We obtained an inter-laboratory agreement with Astrionics and P&VE defining reliability functions, responsibilities and coordination within R&D Operations which should prove to be a good foundation for further improvements in this area. ✓
- g. COST REDUCTION PROGRAM: The interest which personnel of this Laboratory displayed in the Cost Reduction Program during FY-65 was encouraging. Of \$86,968,812 submitted by R&DO, \$63,779,132 came from Quality and Reliability Assurance Laboratory. ✓

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NOTES 1/3/66 HAEUSSERMANN

B 1/10

1. RCA-110A PARITY ERROR PROBLEM: At the SA-201 prelaunch review, considerable concern was expressed about the frequent occurrence of high speed memory parity errors in the RCA-110A computers at Cape Kennedy. Although no definite and permanent fix has yet been identified, it is encouraging to note that no parity errors have occurred in the Cape's system since 12/12. ✓ Maximum attention is still being focused on the problem. ✓

9/13

S-II BATTLESHIP

On five previous attempts to fire the S-II Battleship on December 18, 20, and 21, 1965, the overspeed trip had been picking up, giving cutoff in addition to other problems. An investigation revealed that the LH₂ and lox pump r.p.m. overspeed indication wires were crossed. On Wednesday, December 29, 1965, two attempts were made to fire the Battleship vehicle. The first attempt was made at 2:40 p.m., P.s.t., following a smooth count-down. Mainstage duration was 4.1 seconds, terminated by an erroneous redline observer cutoff. LH₂ pump chilldown was accomplished via the overboard bleed because there are no flight prevalves in the system. The lox recirculation system operated satisfactorily. No problems were encountered in re-cycling the countdown. At approximately 7 p.m., P.s.t., a second attempt resulted in a manual cutoff after approximately 18.6 seconds mainstage duration. At this time, an observer initiated cutoff when the hydraulic cylinder bypass valve did not indicate closed. It was planned to close at T+7 seconds, at which time the slam arms would be dropped. This is a manual operation. At cutoff, the bypass valves indicated closed on the panels, suggesting that they were closed during the run, but that talkback was possibly not received. Obviously, pre-firing checkout procedures are not being adequately performed. ✓

NOTES 1-3-66 HOELZER

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QAD1/3

Negative Report.

B 1/10

NOTES 1/3/66 JAMES

Q481/3

AS-201: The spacecraft forward heat shield repairs are being completed today and spacecraft-to-launch vehicle electrical mate is planned this week. The launch vehicle tests are proceeding satisfactorily. The Headquarters Flight Readiness Review, which has been rescheduled several times, is currently scheduled at KSC for January 10 and 11. ✓

INCENTIVE CONTRACTS: As you recall, at the Management Council meeting Dr. Mueller re-emphasized the urgency of converting our contracts to the incentive type. The remaining problems in my area are the S-IVB contract and the S-IB contract. The S-IVB negotiations have lingered for some time now. We will resume negotiations with DAC next week and, dependent upon their reaction to our recent proposal, it is our hope to culminate this activity as soon as possible. ✓

In the S-IB contract, we briefed Dan Linn and other headquarters people last week on our approach. They accepted the general approach entirely and authorized us to proceed with preliminary negotiations with CCSD. Before finalizing any activity, Dr. Mueller desires to be briefed and this briefing is scheduled for the 11th of January. Both Art Thompson and I are going to Michoud today to discuss the NASA approach with key CCSD personnel with a view to obtaining their early agreement and, thus, presenting a consolidated position to Dr. Mueller on the 11th. ✓

I also called Tom Morrow in order to educate him on the virtues of accepting our lower cost runout figure. ✓ Coupled with this lower figure are some attractive incentive fee arrangements and I believe that Tom Morrow understood the picture completely. I expect that in his conversations with Doug Lowrey he will be very helpful to us. ✓

NOTES 1-3-66 KUERS

B_{1/10}

9/13

Negative report.

9521/3
APOLLO COST STUDY UPDATE - Initial guidelines for this study have been received from Frank Rosenberg, study director. These guidelines have been distributed to the MSFC team members for their review and comments. A meeting of the team members has been scheduled for Tuesday, January 4, to review the comments and discuss the impact of Mr. Hilburn's required completion date of March 26, 1966. ✓

MSFC CEILING - A NASA white form has been received transferring the 3rd increment (20 spaces) of spaces to MSC leaving MSFC with a permanent ceiling of 7359 effective January 1, 1966. On the same white form MSFC's "other" ceiling of 169 was increased by 19 spaces to 188 to allow for participation in the "Youth Opportunity Program--Back-to-School Drive." ✓

CONGRESSIONAL LEGISLATION ON METRIC SYSTEM - Legislation is being proposed to authorize the Secretary of Commerce to conduct a study on the conversion of the U. S. to the Metric system of weights and measures. MSFC has been requested to submit comments that may be used in a NASA position paper on the subject. ✓

NOTES 1/3/66 REINARTZ

B 1/10

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As of this morning (January 3) Dr. Mueller has not signed the AAP LEM Integration Procurement Plan. The word from NASA Headquarters is that he is personally satisfied with the plan and ready to sign, but wants to check on something with Dr. Seamans and one or two other individuals before releasing it. As a result the procurement schedule must now be delayed accordingly. ✓

B 1/10

NOTES - 1/3/65 - RICHARD
K 8 1/3

SA-201 Propellant Slosh-Guidance System Interactions: R-TO with representatives of R-ASTR, R-AERO, R-P&VE, and IO reviewed the status of closed loop simulation studies of SA-201 propellant slosh-guidance system interactions. These studies have revealed an additional effect of lateral vehicle accelerations on propellant motion which couples with the guidance system. The closed loop simulations with a modified heavy F/M filter (flight computer program change) show that these effects will not cause a stability problem. Accordingly, it was agreed that the propellant utilization system for AS-201 be flown closed loop. The filter results in a small error in altitude at cutoff. (Other end conditions, e. g., path angle, are essentially unaffected.) The mission requirements of AS-201 will not be compromised, however. ✓

The laboratories are continuing to analyze the system using this filter and should be able to improve this technique for later flights. ✓

Thrust OK Interlock Change (Saturn IB & V): Coordination was effected to obtain a change in the liftoff logic for SA-201 and subs and 501 and subs to use redundant thrust OK pressure switches in the period from ignition command through liftoff. Currently, the electrical interlock system for SA-201 requires that both switches on each H-1 engine must "pickup" for launch commit, and on SA-202 and 501 and subs that all three switches on each engine must "pickup." This change provides for an increased probability of launch by requiring one out of two switches for SA-201 and two out of three switches for SA-202 and 501 and subs.

Ground Computer Parity Errors: R-ASTR-N (Moore) is pursuing the problem from a hardware standpoint and should eliminate the source of this problem. In the meantime, we are working with all affected elements of MSFC and KSC to minimize the operational consequence of this occurrence. We feel that the recovery time can be shortened by proper procedures, and that the result would be a short delay but not a scrub in the launch of AS-201. ✓

B 1/10

NOTES 1/3/66 RUDOLPH

1/3 9/12

S-II Stage Battleship Firing - A 19 second mainstage duration was achieved at 9:00 pm, CST, on Wednesday, December 29, 1965. ✓

One of the major test objectives, releasing of the sideload arresting mechanism at 12 seconds, was not accomplished due to the flight control system hydraulic by-pass valves not coming closed to allow the hydraulic actuators to be in a hard or locked position. All other major objectives were met. ✓

The tentative scheduled date for the next firing is Wednesday, January 12, 1966. ✓

NOTES 1/3/66 SPEER

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1. OPERATIONS EXECUTIVE MEETING: You were invited to attend the 2nd meeting of the Operations Executive Group (OEG) (chaired by G. E. Mueller) on Saturday 1/8 at KSC. ✓ The agenda includes summaries on: (1) Gemini Missions; (2) Apollo Program; and (3) Apollo Operations. I am planning to attend the Operations Management Group Meeting on 1/7 (chaired by Christensen). This group is also invited to attend the OEG meeting. ✓
2. AS-201 GROUND SUPPORT IMPLEMENTATION: We are concerned about the implementation status of our requirements for AS-201. Documents received thus far are incomplete and partly inconsistent. There are indications that some of our requirements will not be fully met. I have requested that OSRO initiate a meeting to work out a satisfactory support plan consistent with station capabilities and MSFC's established needs. OSRO has accepted this proposal and scheduled a general review at KSC on 1/17. ✓
3. SECURE RANGE SAFETY COMMAND SYSTEMS: In spite of continued high level negotiation at Headquarters, no resolution on the classification problem has been accomplished as yet. Gen. Phillips intends to send a letter to Dr. Mueller recommending: (1) the command system be declassified to Confidential for Apollo flights, (2) checkout be performed via existing hard wire lines, (3) the Launch Director be authorized to radiate the command for checkout if using hard wire lines would result in a countdown hold, (4) the Launch Director be given the option of substituting a new command code in case the command had to be radiated for checkout on a day prior to actual launch. These recommendations represent a compromise between securing destruct commands and making system checkout practical. ✓
4. STAFFING OF FLIGHT CONTROL OFFICE: DAC and IBM have now completed the staffing of the MSFC Flight Control Office at MSC. Effective 1/3 we will have four DAC and six IBM personnel assigned full time to flight control activities at MSC. The MSFC contingent is not yet complete; of the planned total of ten, seven are presently on board. R&DO continue their efforts to identify three additional engineers. ✓
5. PRESENTATION ON APOLLO MISSION OPERATIONS: As recommended by Dr. Rees, Captain Holcomb will repeat the presentation he gave to Mr. Webb during the Apollo Program Review to MSFC personnel. The meeting is scheduled on 1/5 at 9:00 AM in Bldg. 4663. ✓

NOTES 1-3-65 - Stuhlinger

9/8 1/3

B 1/10

NEGATIVE REPLY

AS 1/3

B 1/10

1. S-IVB Workshop. In response to Dr. Mueller's request to have McDonnell Aircraft look into the S-IVB "airlock slice", we have arranged a meeting through MSC (Faget and Matthews) to be held at Houston on Tuesday, 1/4/66, between MSFC, MSC and McDonnell. We will give them a rundown of our designs and plans (not cost) and ask McDonnell to deliver to MSFC an unsolicited (no cost) proposal on the "airlock slice". Also, if McDonnell sees any shortcomings with our concept to so indicate as well as list components or subsystems which they know of that could be used from existing or planned Gemini inventories. ✓

2. Advanced Systems Office Status. The Advanced Systems Office has now been in existence for 6 months and has made fair progress, all things considered. The following items may be of interest:

- a. Our current strength is 78 plus 115 co-located.
- b. We (ASO and co-located) are now located in Building 4202.
- c. We have basically completed the initiation of FY65 Study Program (which was hardly started in July 65).
- d. We have an agreement with MSF and OART on our FY66 Study Program (schedule and dollars) and are attempting to speed up the cycle so that the money is under contract by July 66.
- e. We have made several positive moves to tie the advanced study activities more closely to the advanced technology effort (joint ASO-RPL) and hope to have a more formalized effort by the end of the FY. ✓
- f. The S-IVB Workshop activity is now in high gear and one of the Center's most promising "new" major efforts. ✓
- g. Our relationship with Ed Gray's shop and our OART counterparts is excellent and our situation in the advanced systems area with MSC is improving rapidly. ✓

Although we have a few problems, none of them are insurmountable. I feel that CY66 will be a "good year" for the ASO activity and for MSFC, even though the budget situation may not be what we would desire. ✓

January 10, 1966

gmit
GEORGE C. MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA

Memorandum

TO : Dr. W. von Braun, DIR

DATE: January 19, 1966

FROM : Director, Research Projects Laboratory
R-RP-DIR

SUBJECT: Evaluation of proposals for Voice Broadcast Mission Study

On my Weekly Notes of 1-10-66 (copy attached), you inquired about a letter from Dr. Newell of OSSA requesting MSFC to participate in the evaluation of proposals for a Voice Broadcast Mission Study.

This letter, dated December 28, 1965, was sent to my Laboratory through normal channels for action. We coordinated the matter with Astrionics Laboratory and the Advanced Systems Office, and replied to Dr. Newell with my letter of January 12. Copies of Dr. Newell's letter and my reply are attached for your information.

If you desire additional information, please let me know.

Ernst.

Ernst Stuhlinger

3 Encs:

As stated



: Dr. W. von Braun, DIR

: January 19, 1966

: Director, Research Projects Laboratory
R-RP-DIR

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If you desire additional information, please let me know.

ORIGINAL SIGNED BY
ERNST STUHLINGER

Ernst Stuhlinger

3 Encls:
As stated



NOTES 1/7/66 BALCH

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B 1/12

S-II-T Stage - Reinstallation of the forward skirt was completed on January 3, 1966. Reinstallation of the forward skirt stage systems and repair of the membrane seal and insulation is progressing satisfactorily. Side wall insulation repair will be started during next week. First firing is now expected to be in March 1966. ✓

High Pressure Gas Facility - Contractor is now procuring instrumentation preparatory to testing hydrogen pumps, now scheduled for week of January 17, 1966. ✓

Technical Systems, Phase I - A meeting has been held with Aetron to discuss the installation of the Data Handling System in the Data Handling Center, and Aetron presented alternatives on how the required date of March 15, 1966, for installation and checkout of the off-line equipment could be met; Decision on the course of action to be followed will be made by January 10, 1966. ✓

Local Area Airport Situation is getting more competitive. Mr. Foxworthy and Mr. Morrow and MTF personnel met with Picayune officials and with Hancock County officials to determine present status and future plans. Hancock County is scheduled to hear a report on their initial study on Thursday, January 13. Picayune has completed all design and obtained necessary FAA approvals and lacks only the money to go ahead. Apparently both areas are going to have difficulty in obtaining tax payer approval of any bond issue. ✓

1/14

B 1/12

RL10 ENGINE

A letter delegating quality control and contract administration services to the DOD agency at Pratt & Whitney was issued last week. Full implementation of the agreement is expected within 60 days, with a resultant saving of 11 MSFC spaces. ✓

F-1 ENGINE

Thru January 5, 1966, 1,263 R&D engine system tests for a total of about 89,910 seconds have been conducted. Of these, 419 tests were for full duration with 139 exceeding 160 seconds. During CY 1965, a total of 456 R&D engine system tests for a total of about 51,742 seconds were conducted. Of all R&D engine system tests conducted thru CY 1965, 36.2% were conducted in CY 1965 and of the total seconds, 57.9% were accrued in CY 1965. ✓

The failure of the LOX pump on R&D engine 029 is still under investigation. Efforts are being made to determine the significance of the time (110 seconds) factor in the past three T/P explosions. ✓

Negotiation efforts on the incentive conversion of the deliverable hardware contract ended in no agreement. The project level government personnel felt that the Rocketdyne proposed combinations of high target cost, high target fee, high minimum fee, hot test risk clause and a ceiling on maximum schedule fee penalty per month would not give a reasonable incentive contract from the government viewpoint. Attempts will now be made at the Engine Program Office — Rocketdyne Management level to find a solution more palatable to the government. ✓

J-2 ENGINE

Seven tests were attempted on the S-II Battleship program between December 18 and 29. Of these, the only engine malfunction was on the first test when the engine failed to obtain an "engine ready" signal. This was traced to a bent pin in an electrical connector. The major problem relative to the engine is the inability of the stage hydrogen recirculation system to properly condition the engine. One of the valves in the stage manifold system has such a small diameter it restricts the flow of recirculation hydrogen to the engine. An overboard bleed has been added as an interim method of engine conditioning in order to proceed with testing. ✓

General O'Connor and Mr. Gorman were briefed Friday, January 7 on the presentation to be given to Dr. Mueller on January 11 concerning the combination of J-2 contracts and sustaining engineering. ✓

GENERAL

The UAW at ERB voted Saturday by an overwhelming majority to reject the Company's offer. There will be further negotiations -- probably beginning the middle of next week. Before the UAW walks out, they will have to take another vote (this is written into their constitution) and should this vote be in the affirmative to strike, there is a 10 day waiting period before they walk out. ✓

NOTES 1-10-66 CLINE

B 1/14

NEGATIVE REPORT

1/14 JS

FS 1/14

1. PRESENTATION ON MICHLOUD HURRICANE PROTECTION

The Corps of Engineers and the Orleans Levee Board made a joint presentation to Gen. O'Connor and the Michoud management on interim and future plans for hurricane protection for the Michoud area. We feel that by continued work with the Corps of Engineers and the New Orleans Levee Board additional interim protection for the plant can be secured prior to the next hurricane season. ✓ Interim protection is used in the sense that it will not offer the same degree of protection that will be obtained by the long range plan being pursued by the Corps of Engineers, expected to take up to 10 years to complete and covering the eastern half of Orleans Parish. ✓

2. LTV ASSUMES RESPONSIBILITIES AT SLIDELL

Ling-Temcc-Vought, Range Systems Division, will assume operational responsibilities at the Computation Office, Slidell, on Monday, January 10, 1966. Approximately ten Telecomputing Services, Inc. personnel will remain on-site for periods of up to 30 days to assure continuity of services. Phase-over activities have been accomplished, up to this point, in a highly satisfactory manner. All parties involved including user contractors have been most cooperative during this changeover. ✓

8/1/4

B 1/14

1. Experiments Coordination

MSFC #1 "Dielectric Materials" and MSFC #2 "Thermal Control Coatings" - Dr. Turnock, Apollo Program Office, has requested to hold final procurement action on these experiments until Dr. Mueller has reviewed presently proposed experiments in spacecraft and stages, the pallets, and the standard payload module. This review will be held separate from the 1-17-66 MSFEB meeting. MSFC will continue procurement planning for the approved Experiments in order to be ready for procurement release upon Dr. Mueller's decision. ✓

Laser Experiments - Results of the OART-requested feasibility study on MSFC #15, "Precision Optical Tracking," will be available in early March, 1966. It is understood that Mr. Wood, OART, will propose a feasibility study by MSFC on MSFC #16 "Optical Guidance System." ✓

B1/14

1. AS-201 PU System-Guidance Interaction

An analysis was made in order to determine the effects on guidance accuracy of the latest (M) smoothing filter (#4). This filter substantially reduces the effect of sloshing on attitude rates, but degrades the altitude by 2.2 kms. However, the envelope about this case is the same as that prior to the introduction of sloshing in the calculations. Therefore, the terminal radius vector will be biased in order to achieve the same nominal cutoff conditions as was published in the AS-201 operational trajectory. One other interesting effect of this filter #4 is that the guidance system may not sense PMR shift, however, in this case, guidance staging will be given by the backup timer. The consequence of the guidance system not sensing the PMR shift is a reduction in residuals of approximately 250 lbm at guidance cutoff signal. The current residuals are on the order of 6400 lbm which can easily absorb this loss. ✓

2. Control Studies for the "Standard Launch Vehicle"

Cursory rigid body studies of the Saturn IB vehicle without fins (AS-207 trajectory and mass model were selected due to data availability) have been made for the maximum q and the maximum q ω time points, using an idealized angle-of-attack control system with drift minimum gains. Our study results, which were compared with those from the "Standard Launch Vehicle Study", support Chrysler's findings; in order to control the vehicle, the gimbal limits must be increased from the present 8° to 10°. Control filters would be expected to reduce the required gimbal angle somewhat, however, flexibility effects may again raise the required gimbal angle (still expected to be less than 10°). Further studies on control filter effects will be made. Preliminary calculation of bending moments for the idealized system (10° limit) reveals an increase in bending moments of about 5% over the normal SA-207 vehicle. ✓

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B 1/14

Q8 1/14

1. S-IB QUALIFICATION TESTING: The S-IB-201 component qualification status as of 1-1-66 was 178 of 195 components being monitored have been qualified. Of the 17 unqualified, eight waivers have been granted for flight on SA-201 only. The remaining nine items are expected to complete qualification prior to flight of 201. ✓
2. GROUND SUPPORT EQUIPMENT (GSE): The GE Quality Program Plan for the ESE program, contract NASw-410 has been reviewed and, with the exception of minor comments, the plan is acceptable. ✓
3. S-IB COMPONENT TESTING: This Laboratory has been processing and testing all telemetry components for Chrysler since the S-I/IB programs began at Michoud. Chrysler has now completed procurement of an MSFC/Quality designed test set and began assumption of this responsibility. ✓
4. MC TYPE FITTINGS: With the inception of the MC type fitting, classification of defects became an incessant problem resulting from disagreement between the suppliers and source inspectors as to what constituted a critical, major or minor defect. This Laboratory prepared a document, listing all attributes of the various MC fitting designs and classifying each attribute, which resulted in MSFC STD-437, FITTINGS, CLASSIFICATION OF DEFECTS. The standard also established minimum acceptable quality level requirements, and is now being used as a guide for establishing inspection procedures by both the suppliers and government agencies. ✓

1. RCA-110A PARITY ERROR PROBLEM: It was erroneously reported in last week's notes that no parity errors had been recorded at Cape Kennedy since 12/12. The date should have read 12/17. Additional intermittent problems which did not show up as parity errors were experienced with the computers on 12/29 and 12/30. Although these latter discrepancies were probably hardware related, the possibility also exists that they were caused by computer programing difficulties. An additional parity error was experienced on 1/9 in the AGCS computer. The problem disappeared during trouble-shooting. In an attempt to isolate the cause of the intermittent problems, RCA is continuing on a 3-shift basis to analyze module boards which are suspected of causing an intermittent failure in any system in the field. ✓

2. LVDC/LVDA DIFFICULTIES: Production difficulties are still being experienced by IBM. Fractured s-clip and c-clip connections were found in production systems no. 3 and no. 4 at IBM-Owego during and after acceptance tests. These difficulties will cause further delays in delivery of the equipment scheduled for flight on SA-202. ✓

NS 1/14

B 4/14

S-IC-T

The S-IC-T stage is in the process of being prepared for removal from the test stand which is scheduled January 17, 1966. Continued progress is being made toward checkout of the GSE and the S-IC stage in the automatic mode. ✓

F-1 ENGINE

Test TWF-072 was conducted at the Static Test Tower West (STTW) Test Facility on January 7, 1966, with F-1 engine S/N F-1002-3 for a mainstage duration of 56 seconds. Primary test objectives were to evaluate the effects of helium injection in the lox system and to determine the effects of eliminating the low lox dome purge during thrust chamber pre-fill. ✓

S-IB-4

Functional tests and lox and fuel systems leak checks were performed during the week. A propellant loading test in conjunction with a simulated flight sequence test was performed January 5, 1966. After the test, the pump inlet screens were removed and a piece of white tape, 1" x 3/4" size of unknown origin was found on the lox screen of engine No. 8. The engine hydraulic system, including actuators from engine No. 1, was replaced due to gross contamination of the system caused probably by O-ring deterioration in the accumulator. The short duration firing is scheduled for January 14, 1966. ✓

S-II BATTLESHIP (SANTA SUSANA)

Data from 18 seconds firing on December 29, 1965, showed Engine Position No. 1 slam restrainer was released accidentally during transition. The hydraulic system was not activated; however, film showed slight movement during transition and no movement after mainstage. Dry gimbal test was scheduled to begin Saturday, January 8, 1966, utilizing the MSFC gimbal computer in preparation for full duration hot gimbal firing on January 12, 1966. ✓

S-IVB (SACRAMENTO) VEHICLE 203

Propulsion system checkout is scheduled to begin Monday, January 17, 1966. Pre-static activity at SACTO is satisfactorily progressing toward an anticipated February 9, 1966, firing date. Vehicle 203 schedule is tight due to vehicle 205, which is to be installed in Beta I test stand after 203. Vehicle 205 is due to arrive April 1, 1966. Currently, S-IVB-204 is to be shipped to Sacramento Test Center on January 15, 1966, with the acceptance firing in Beta III scheduled for mid-March 1966. ✓

K.H.
Pretty
ea-
congratulating,
isn't it.
B

NOTES 1-10-66 HOELZER

9/14

B 1/14

1. THIRD GENERATION COMPUTER STATUS: The preproposal conference in connection with the RFP issued December 17, 1965, will begin at 9:30 a.m. on January 12 with a tour of facilities at Slidell. It will be continued in Huntsville on January 13 with a facilities tour and a question answering period held in the Tenth Floor Conference Room, Building 4200. ✓
2. ADDITIONAL DATA CENTER COMPUTER CAPACITY: On January 8 and 9, an IBM 7010 was installed in Building 4491, replacing the last 1410 computer system. This change out of computer main frames will give the Data Center needed increased capacity at a relatively low increase in rental. The central computers in the Data Center are now two IBM 7010's with one system "on line" to the TMB Supply System, the PRINCE/APIC System and Data Center users. The other system is mainly for "batch processing" systems. Both are heavily utilized. ✓

983 1/14

B 1/14

CCSD INCENTIVE CONTRACT: I participated with Art Thompson, Doug Lowrey and the government/contractor negotiating team last week in an effort to develop a mutual position with the contractor prior to presenting our final negotiating position to Dr. Mueller. After a day of negotiations, CCSD did not present any cost proposals which we felt were negotiable. On Tuesday afternoon we made an offer with a cost figure we feel we can support. CCSD took the offer under consideration and after contact with Detroit, decided to accept. Consequently, we have basic agreement on the cost and general incentive structure. Art Thompson reviewed this position with Dan Linn at Headquarters on Friday and a presentation to Dr. Mueller is scheduled for Tuesday. I will attend this presentation. ✓

DAC INCENTIVE CONTRACT: We met last week (plus Saturday and Sunday), with Ollie Hirsch's people and DAC, to finalize the S-IVB conversion to incentive. DAC apparently came this time to really negotiate. We reached agreement Sunday with DAC on all major features. Since this agreement is a little outside of the latitude Dr. Mueller gave us, Ollie and I plan to contact Gen. Phillips and obtain permission to deviate. We can then finalize with DAC. ✓

IU DESIGN REVIEW: We have received a request from Gen. Phillips to schedule a one day design review at MSFC for him on February 24. Gen. Phillips asked for a presentation on past activities and future plans to review IU specifications to identify possibilities of relaxations to facilitate manufacturability, cost, schedules, etc. Gen. Phillips asked that this be covered in the context of an overall IU Design Review. My office (Bill Simmons) has the action. We have met with R&DO, Saturn V and Mr. Downs (Bellcom) to discuss preparation for this review. We will provide Gen. Phillips with a tentative agenda this week and request that the review be held about March 15 in order that it may include 201 flight data. Instead of 2, 3

APOLLO HARDWARE CONFIGURATION CHANGES: As a result of a discussion at the December Management Council, Gen. Phillips took an action item to develop the policy and procedures for handling changes to currently approved Apollo hardware to have the capability to accommodate possible AAP missions. ✓ We have been advised that Gen. Phillips' staff will prepare a policy document and procedures within the next few weeks and staff them with the centers before publication. It is further understood that this policy and procedure will deal with experiments and experiment integration into Apollo hardware. In this regard, we have received a TWX signed by Dr. Turnock directing that we hold up final procurement action on Experiments MSFC #1 and #2 and the standard payload module until further direction is received. ✓

LB1 ✓

I'd like to see that document before we give MSFC concurrence
B

← IMPORTANT

NOTES 1-10-66 KUERS

B 1/14

9/8 1/14

Neutral Buoyancy Facility: Our 25 foot diameter tank facility (originally used for explosive forming experiments) has been modified for use as a neutral buoyancy (zero g) facility. A spare vehicle corrugated skin section with a conical "roof" attached has been installed over the tank. Regulated steam heating of the water has been included, and lights have been provided inside the enclosure. In conjunction with the bio-engineering group in P&VE, our immediate objectives are precision time line metabolic and tool analyses of two tasks crucial to the S-IVB workshop experiment:

- a. Air lock ingress, egress, operation and familiarization test conducted with a simplified air lock mock-up.
- b. Removal of the S-IVB hatch cover.

The ST-124 and propellant utilization valve removal studies will follow. All tests will be conducted initially using Scuba gear but an astronaut suit will be employed as soon as the water immersion details have been worked out. Two of our people have been checked out in astronaut suits so far. They, as well as others from P&VE, will use the facility.

W.K.

Very interesting. I'd like to see that facility as soon as possible. Please arrange with Bonnie.

B

B 1/14

9/21/14

APOLLO COST STUDY UPDATE - The team established to guide MSFC's activities in this study has proposed a schedule for accomplishing the effort by May 13. Mr. Hilburn desired a completion date of March 26 in order to use the data as a basis for preparation of the FY-68 Preview Memorandum due in BOB on May 1. MSF has established the groundrule, and we agree with it, that contractor efforts should not be initiated until after the major effort toward incentivizing their contract is complete. The MSFC proposed schedule is consistent with the MSF groundrule. A letter to Dr. Mueller providing the proposed schedule was delivered to Dr. Rees for signature on January 10. ✓

NASA HEADQUARTERS OPERATIONAL POLICY AND REALIGNMENT - We have obtained an advance datafax of Mr. Webb's December 29 Memorandum to heads of all Headquarters offices and Field Center Directors establishing a new overall operational policy of the realigned "Office of the Administrator," and explaining other significant changes. The realignment essentially combines the Seamans and former Dryden functions, although, for the present, Dr. Seamans will also retain the title of "Associate Administrator." Mr. Shapley will become the Associate Deputy Administrator. The heads of functional staff offices, formerly on two levels, will become "Assistant Administrators," and will report to Dr. Seamans. Mr. Buckley will become "Associate Administrator for Tracking and Data Acquisition," on the same level as MSF, SSA, and ART.

Details of the proposed changes are planned to be presented at the next Board Meeting on January 21. ✓

AAP SUBMISSION FOR POP 66-1 - Officially, there will be no Center submission for AAP. Unofficially, MSF (Pam Fields' Office) is planning on requesting AAP funding data for their use in POP 66-1. This exercise will be called a "Preliminary Program Plan and Budget," but is essentially an addendum to the POP exercise. AAP guidelines have been prepared and if concurred in within MSF, will be reviewed with Center representatives at MSF in mid-January. If the secrecy covering the President's Budget is not lifted by then, these guidelines will not be released, since they reflect the new agency cuts.

→ Please keep me
informed without delay
B

→ H.M.
by whom?
Taylor?
B

NOTES - 1/10/66 - RICHARD

B1/14

SA-201 Launch Preparation: We made a one-day trip on 1/5/66 to KSC with Col. James to review any last minute technical problems that might have come up since the preflight review. Although there were small problems here and there, the prelaunch work is on schedule and the general confidence of the launch crew has improved. ✓

KSC completed the SA-201 launch vehicle plugs-in overall test Friday, Jan. 7. The detailed analysis of the test results is being conducted this morning (Jan. 10). Several minor discrepancies have been found, but based on what they have seen so far, the LVO people feel they are ready for spacecraft mating. If time allows, the plugs-in overall test will be rerun with all corrections incorporated. ✓

NOTES 1/10/66 RUDOLPH

JS 1/14

3 1/14

1. S-IC Stage:

Major Activities scheduled during January 1966:

<u>Stage</u>	<u>Activity</u>	<u>Date</u>
S-IC-D	Move from ME Lab to dynamic test stand	13 Jan 66, Thurs
S-IC-T	Move from captive firing test stand to ME Lab	14 Jan 66, Fri
S-IC-F	Ship from Michoud to KSC	14 Jan 66, Fri
S-IC-2	Move from ME Lab to Qual Lab	17 Jan 66, Mon
S-IC-1	Move from Qual to ME Lab	17 Jan 66, Mon
S-IC-1	Move from ME Lab to captive firing test stand	24 Jan 66, Mon. ✓

First Article Configuration Inspection (FACI) - for S-IC-3 structures will begin at Michoud, Monday, 10 January 66 and is expected to be completed by Monday, 31 January 66. || ✓

2. S-II Battleship Stage:

- Full duration firing (approximately 360 seconds) with flight configuration engines scheduled for Wednesday, 12 January 66. ✓
- A 5.5 mixture ratio will be initiated for the last 25 seconds of test. ✓
- Cut-off will be initiated by propellant depletion. Due to high mixture ratio cut-off will occur earlier than normal flight period. ✓
- This will also be the first hot firing engine gimbal test. ✓

3. Flight Stage S-IVB-501 - Continuity checkout is complete. Power on checks were started on Tuesday, 4 January 66. Douglas predicts checkout will be completed on Tuesday, 8 February 66, as scheduled. ✓

NOTES 1/10/66 SPEER

8414

B 1/14

1. FLIGHT OPERATIONS PANEL: A meeting of the Flight Operations Panel was held at MSFC on January 6. Items of interest include:

(1) S/C orbital checkout time for lunar mission: MSC is to review and confirm, but estimated a minimum of 45 minutes to prepare S/C for the lunar injection, NAA originally requested 110 minutes, but was turned down by MSC. (2) MSFC support of AS-501: A principal problem is the possible inavailability of the Ascension Island Unified S-Band station to provide communications in the waiting orbit. OTDA is working to improve the Ascension schedule. Apollo ship scheduling is another problem, since only one will be ready for 501. (3) Guidance switchover and FIDO aborts: A communications problem seems to exist between MSFC and MSC in working out guidance switchover and Flight Dynamics Officer (FIDO) abort criteria and procedures. (A separate meeting was held on 1/6/66 by Flight Mechanics Panel on this subject.) The Flight Operations Panel is taking action to discuss operational aspects. ✓

2. AS-201 ANTENNA PATTERNS: A TWX was received from General Phillips relaying a complaint from ETR that insufficient AS-201 antenna pattern information (L/V and S/C) had been provided to commit range support. Launch vehicle information had been sent previously but apparently not received properly by ETR. MSFC has re-submitted the information and has been informed through KSC that launch vehicle information is now adequate. ✓

3. AS-201 NETWORK SUPPORT: The ground network coverage gap between Antigua and the Rose Knot Victor ship will be filled by the Sword Knot ship. Reception of data during S-IVB/IU attitude maneuvers after S/C separation will be improved. ✓

4. AS-201 FLIGHT READINESS ASSESSMENT: The MSFC Flight Readiness Assessment Report for AS-201 Mission Operations was sent to Headquarters on January 4. ✓

5. AS-201 BLOCKHOUSE ATTENDANCE: Advance information from Headquarters indicates only two MSFC representatives (yourself and Col. James) will be admitted to the LCC-34 Operations Management Room for the AS-201 launch. One MSFC engineer will be in the LCC-34 computer room. Approximately 10 MSFC engineers who have been requested by KSC for on-site support will be in the LVO Launch Support Room, being established in the CIF in a very similar manner to LIEF. ✓

(Central Instrumentation Facility)

B 11/14

1. PEGASUS: No significant changes in Pegasus data. A nine month extension to the SATCON contract was finally negotiated with FHC on December 29. The contract calls for a total of 17 people. ✓

GSFC was requested to change operating procedures regarding Pegasus data tapes that will substantially reduce the number of data tapes being sent to MSFC from the STADAN stations. ✓

2. AAP - EARTH ORBIT: A briefing to you on the status of potential astronomical experiments is being prepared for February 1. ✓

The letter from OSSA (Dr. Newell) requesting MSFC participation in the TV Broadcasting System proposal evaluation is being answered jointly by RPL, ASO, and ASTRI. MSFC will participate in this activity with one representative each from RPL, ASO, and ASTRI.

LUNAR SURFACE: Contacts were made with the Corps of Engineers, the U.S.G.S., and various elements of MSFC for increasing the technical management team of the North American study, "Scientific Mission Support, Extended Lunar Exploration," for which RPL has technical supervision. A trip to the contractor's facilities is planned next week. During the same week the Lockheed facilities at Sunnyvale, California, will be visited in connection with coordination between the NAA study and the Mission Modes and System Analysis (MIMOSA) study awarded to Lockheed. ✓

Three work statements were submitted to OMSF-MTL relating to an integrated package of soil-mechanics studies. Relative to the same studies a visit to the University of California, and to the firm Shannon and Wilson, Inc., is also scheduled for next week. ✓

(All. Institute of Technology Research Institute)

3. RESEARCH ON S-13 COATING: Members of IITRI reported on further research under our contract in connection with the S-13 coating that was used on Pegasus flights. More information has been obtained on an anomaly which this coating exhibits in the infrared. It consists of very fast recovery of degradation on exposure to air (somewhat less total recovery when nitrogen is bled into the vacuum system though the rate is as fast or faster). While this does not account for more than about 25% of the lowered values of reflectance shown by the Pegasus coatings, it is a serious concern. Immediate efforts to remedy the condition have shown that pre-treatment of the oxide can be effective, at least in preliminary experiments. Apparently, the anomaly is a surface effect (nothing else would be likely to have as short a time of reaction). This verifies measurements made in-house by RPL. ✓

B 1/14

MS 1/14

1. S-IVB Workshop. We had a very productive meeting last Tuesday and Wednesday (1/4 and 1/5/66) at Houston with MSC and McDonnell on the S-IVB Workshop. In view of Dr. Mueller's desire to have a "near zero cost" Workshop, we have made several compromises. In essence, we have come up with the basic groundrules for MSFC and McDonnell to work up new "proposals" on as follows:

- a. The "airlock slice" will be an independent unit, i. e. not be functionally tied into the IU system. ✓
- b. Gemini subsystems/systems will be used in the Environmental Control System, Electrical Supply System, etc. ✓
- c. Use of CSM for all data handling and telemetry. ✓

Our current plans are to basically complete the MSFC proposal by 1/13 or 1/14/66 and receive the McDonnell proposal in a meeting with them here at MSFC on Friday, 1/14/66. We then plan to develop a recommended proposal (MSFC doing part and McDonnell doing part) to propose to Mueller. Although it was suggested that MSFC present this material to the Management Council Meeting, this has now been postponed. Ed Gray is getting a date, but it will not be before January 20. *new scheduled in Wash.*

I feel that the manner in which we make this next presentation to Dr. Mueller is rather critical. Specifically, what MSFC's role will be, what it costs, how it will be managed, and what the 209 system will be as well as how firmly we stick to our recommended proposal. *all this seems to be greatly affected by McD's presentation and our general reaction to it.*

2. Ed Gray Weekend Meeting. Ed Gray has asked Max Faget, Rocco Petrone and I to meet with him and his staff the weekend of January 21 to go over the overall advanced systems planning, its funding, tie in to AAP, etc. I definitely plan to attend. ✓

McDonnell said,
housekeeping
telemetry for
ECS and
airlock
would
use
refurbished
Fentini
telemetry,
for
GSE
compati-
bility,
etc.
B

But experiments in
workshop use SIVB
and/or
I.V.
telemetry
don't
they?
B

our
general
reaction
to it.
B

B 11/14

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Bonnie

I'd like to see that letter at once.

Why was it not shown to me??

B

LUNAR SURFACE: Contacts were made with the Corps of Engineers, the U.S.G.S., and various elements of MSFC for increasing the technical management team of the North American study, "Scientific Mission Support, Extended Lunar Exploration," for which RPL has technical supervision. A trip to the contractor's facilities is planned next week. During the same week the Lockheed facilities at Sunnyvale, California, will be visited in connection with coordination between the NAA study and the Mission Modes and System Analysis (MIMOSA) study awarded to Lockheed. ✓

E.S.
let's have a discussion on latest status and views re lunar surface activities
B

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(all. distribution of Technology Research Institute)

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Enc 1



ACTION R-DIR w/enc 12/29
INFO Copy to: DIR; DEP-A; I-DIR; E-DIR; AST-P

72 miles
Oct 20

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WASHINGTON, D.C. 20546

R & D Action to: *Leff*

Info Copies to: *Leff*

Date *12/29/65*

IN REPLY REFER TO:

To: Dr. Wernher von Braun, Director
George C. Marshall Space Flight Center

From: S/Associate Administrator for
Space Science and Applications

Subject: Request for Proposal No. BCS-10-6642 for
Voice Broadcast Mission Study

By means of the Request for Proposal No. BCS-10-6642 for "Voice Broadcast Mission Study," a copy of which is enclosed, this Headquarters has invited industrial and non-profit organizations to submit proposals for a study of the feasibility of a satellite capable of broadcasting directly to conventional home FM radios and/or short wave receivers. The due date for these proposals is January 15, 1966. Promptly following their receipt, a technical evaluation will commence as required by NASA Procurement Regulation.

To assist Headquarters personnel in the technical evaluation process, your Center is invited to designate one or more individuals to participate on the technical evaluation of the proposals, according to your elected interest. A number of your people are aware of the RFP contents by virtue of discussions with Mr. A. M. Greg Andrus; they have expressed some interest in participating in the technical evaluation of the proposals.

Although the anticipated number of responses will probably require about two meetings of this evaluation team, we shall give the proposals preliminary screening to ensure that the evaluation time of your designee(s) is spent productively. Upon receipt of your reply, Leonard Jaffe, Director of Communication and Navigation Programs Office will be able to furnish specific information regarding the scheduling of meetings for the evaluation team.

Leonard Jaffe
Homer E. Newell

Enclosure



Enc 2



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WASHINGTON, D.C. 20546

IN REPLY REFER TO

BCS

December 1, 1965

Gentlemen:

Subject : Request for Proposal Number BCS-10-6642

The National Aeronautics and Space Administration proposes to engage under contract two or more firms qualified to conduct a study effort to define and examine in detail the technological and cost factors involved in the conceptual design of an unmanned satellite which is capable of transmitting aural material directly to home receivers. This requirement is explained in Attachment 1, Statement of Work.

It is desired that fixed price contracts for this requirement be established with periods of performance of six months each. Attached is a copy of General Provisions, NASA Form 247 (March 1965) which will be included in any resulting contracts. You are invited to submit a proposal to perform this research study.

Your proposal must be prepared in two physically separate parts entitled respectively "Technical/Management Proposal" and "Cost and Business Proposal" in accordance with Attachment 2, General Instructions. Each part of your proposal must be complete in itself, since evaluation of each part will take place independent of the other.

The technical/management portion of your proposal must be submitted in twelve copies and the cost and business portion in four copies, both to NASA Headquarters, Headquarters Contracts Division, Code BCS, Washington, D.C. 20546 and must be received not later than 4:00 p.m. EST, January 14, 1966. The technical/management portion of your proposal should not exceed 100 pages. Proposals delivered by hand must be brought to Room 605, 300 7th Street SW. (Reporters Building), Washington, D.C. To prevent opening by unauthorized individuals, your proposal should be submitted in or under cover of the enclosed envelope. Oral presentations supporting written proposals are not presently considered necessary; however, additional data or oral discussions may be called for during the evaluation process.



Keep Freedom in Your Future With U.S. Savings Bonds

Your proposal should contain a statement to the effect that it is firm for a 90 day period.

Your proposal must state the type of legal entity of your organization and the state of incorporation, if a corporation. It must also include the name and title of the person who has authority to contractually bind your organization and who will be designated to sign any contract instrument resulting from this solicitation.

This request does not commit the Government to award a contract or pay any costs incurred in the preparation of a response. The Government reserves the right to accept or reject any proposal received by reason of this request or to negotiate with any qualified source. The Government also reserves the right to consider proposals or modifications to proposals received after the time and date established herein, but prior to the award of a contract, should such action be in the best interest of the Government.

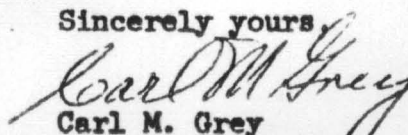
Information will be disclosed to offerors in accordance with regulations applicable to negotiated procurements (NASA Procurement Regulation 3.804-4). Written notice will be given to unsuccessful offerors subsequent to evaluation of all proposals received.

The Size of Business Statement, Contingency Fee Statement, Buy American Certificate, Current Pricing Certificate, Certificate of Independent Price Determination, and Equal Opportunity Certificate, which are separately attached, are a part of the Request for Proposals, and must be fully executed in order for your proposal to be considered responsive.

Your attention is invited to the fact that the Contracting Officer is the only individual who can legally commit or obligate the Government for the expenditure of public funds. No costs chargeable to any contract resulting from this request may be incurred before receipt of a fully executed contract or specific written authorization from the Contracting Officer. The Government will limit its negotiations to the price submitted with the offerors' original proposals and will not consider any increases in price unless the scope of the original proposals have been altered.

No pre-proposal briefing session is scheduled for this procurement. Questions involving the technical details of this request should be directed to Lt. Col. W. C. Mathews, Code ST-1, Washington, D.C., Telephone WO-2-1608. Questions concerning matters of a contractual nature can be directed to Mr. J. B. Phillips, Jr., Code BCS, Washington, D.C., Telephone WO-2-1411.

Sincerely yours,


Carl M. Grey
Contracting Officer

Attachments a/s

ATTACHMENT 1

WORK STATEMENT

VOICE BROADCAST MISSION STUDY

1. INTRODUCTION

1.1 Scope

This statement of work defines the effort required of contractors for a six month Voice Broadcast Mission Study.

1.2 Study Objectives

The purpose of this study effort is to define and examine in detail the technological and cost factors involved in the conceptual design of an unmanned satellite which is capable of transmitting aural material directly to home receivers. A prime consideration is that such a satellite be fully successful without major modifications or expenditures to the receiving system. The results of this study effort will be used by NASA to help direct its future research and development program and assess the need for a voice broadcast spacecraft development and flight test program. The study outputs required for this planning include the following:

a. Specifying and analyzing the gross technical requirements and performance parameters of the Voice Broadcast System.

b. Definition of feasible spacecraft configurations for meeting the mission objectives, analysis of the performance capabilities provided by these configurations, selection of a preferred approach, evolution of a conceptual design based on the preferred approach, and detailed analyses of the conceptual design for the spacecraft, subsystems and components.

c. An evaluation of technology required to meet the mission objectives, specifically what is available, state of the art, or requires additional development. It is expected that judgement decisions will be required as to technology available.

d. Definition of a recommended plan and procedure for spacecraft development, including identification of and approaches to solutions of critical technical problem areas.

e. An estimation of spacecraft schedules and development costs for NASA planning purposes.

1.3 Mission Objectives

The objective of the Voice Broadcast Mission is to develop and demonstrate the technology required for broadcasting aural material from unmanned satellites directly to conventional home receivers.

2. CONTRACTOR TASKS AND GUIDELINES

2.1 General

The following paragraphs specify factors which will be included for consideration. These factors are in no way to be considered as constraints, ingenuity and the development of new concepts and ideas will be given maximum consideration in the acceptance of proposals.

The study will consider two spacecraft configurations, one in the HF band and one in the FM band.

2.2 Propagation

The effects of the medium of propagation will be investigated and analyzed in terms of mission requirements and overall phenomena. Include a detailed analysis for appropriate frequency bands including such factors as attenuation, reflection, refraction, polarization and solar activity which influence, dictate or constrain frequency selection.

2.3 Frequency of Operation

The operational version of a broadcast satellite will probably operate at frequencies presently allocated on an international basis. Therefore, in addition to technical factors which appear to favor specific portions of the spectrum, full consideration must be given to CCIR and ITU recommendations, FCC regulations and accepted engineering practices. There are two additional major factors which should receive consideration: the potential audience for demonstration purposes (in terms of receiver distribution and present terrestrial coverage), and that the feasibility could also be demonstrated by operating in frequency bands with characteristics similar to those normally allocated for broadcast purposes. A conclusion of this portion of the study may be that the U.S. should initiate procedures for the allocation of frequencies on a sharing basis, clear channel basis, or in bands not presently used for this purpose.

The advantages and disadvantages of specific portions of the spectrum considered feasible for use are to be developed. Prime consideration will be given to the spectrum between 15 Mc/s and 25 Mc/s, and 87 Mc/s to 108 Mc/s.

2.4 Orbits and Received Power Levels

The advantages and disadvantages of various orbits will be developed. Those offering distinct advantages will be explored in depth. The orbits investigated will include those which provide on the order of one or more hours of broadcast time to a home receiver using system parameters developed. A major implication of orbit selection is that the demonstration must "fully demonstrate" the feasibility of this broadcasting technique.

Signal Strength for VHF/FM

The analysis will include at least the range of 50 to 250 microvolts per meter.

Signal Strength for HF/AM

Use the CCIR recommendation 415 for a type B receiver and typical sets in household use.

2.5 Antennas

2.5.1 Spacecraft

The study will consider antennas now in use or considered as being feasible.

Evaluate such factors as stabilization requirements and interface problems, steering requirements, pattern shaping techniques, polarization weight and size, environmental degradation, packaging and deployment, and performance specifications. Consideration will be given to beam shaping techniques for continental coverage. The analysis will also consider the use of redirective arrays versus separate transmitting and receiving antennas.

2.5.2 Ground Receiving Antennas

FM - Assume 4 - 12 db gain antennas

AM - Specify a typical installation

2.6 Power Sources

The study will consider the potentially feasible power sources within this decade. Specifically included will be an analysis of nuclear derived sources, solar dynamic systems, solar arrays, or combinations thereof.

The study will consider a "duty cycle" factor and analyze the system trade-offs in such terms as power, weight, lifetime, storage capacity requirements, and reliability.

A comparison evaluation will include such factors as orientation, weight, development requirements, shielding and environmental factors, lifetime, cost and interface problems.

Specific conclusions should be made as to system choices, technological advances required, and areas of questionable feasibility.

2.7 Spacecraft Configuration

Define the feasible spacecraft configurations capable of meeting the mission objectives, analyze the performance capabilities provided by these configurations, select a preferred approach and make a detailed analysis of the conceptual design including structural design, thermal considerations, constraining factors, vehicle interface problems, stabilization requirements, etc.

2.8 Subsystem Requirements

Specify overall spacecraft subsystem requirements with recommendations based on a comparative analysis. A detailed evaluation will be conducted wherever the feasibility is questionable; particular emphasis will be placed upon the communication subsystem. Include a discussion and analysis of multi-channel operational techniques which could be employed. Problem areas are to be delineated and recommendations on overall system approaches for integration are to be made.

2.9 Attitude Control and Station-Keeping

Investigate and analyze attitude control and station-keeping techniques as applicable. These will be based on a two-year minimum lifetime. Consider active, passive, and hybrids, including sensor analysis. Define optimum approaches based on mission requirements. Investigate trade-offs involved in using antenna pointing techniques vs. spacecraft stabilization.

2.10 Wideband Mode

Consideration should be given to including a capability of a wideband mode of operation, 5 Mc/s to 10Mc/s bandwidth, in the VHF/FM transponder.

2.11 Ground to Satellite Communication System(s)

Analyze ground to satellite link requirements in such terms as configuration, overall system specifications, communication parameter trade-offs, and recommend an approach. Include an analysis of command and control techniques.

2.12 Integral Support Requirements

Specify support requirements including cost estimates. Include requirements for tracking, data handling and evaluation, management, and logistics.

2.13 Vehicles

Analyze vehicle requirements for placing the spacecraft into selected orbits which will fulfill program requirements in terms of vehicles then expected to be available. Compare and evaluate on such factors as allowable payloads, volumes, constraints, and cost. Consider direct injection and the use of "kick motors" where applicable. Define known or probable constraints.

2.14 Cost Comparison

Estimate costs of suggested system approaches, including as necessary, developmental costs. Make a detailed analysis of the preferred approach.

2.15 Flight Experiments

Recommend flight experiments necessary to meet the mission objectives.

2.16 Briefings and Reports

The contractor will be required to brief representatives from the Communication and Navigation Programs Office at the stated intervals following the award of a contract.

30 to 45 days - This briefing will summarize the initial study results as to gross technical requirements over all system performance parameters, and indicated possible avenues of approach.

150 to 160 days - This is a formal detailed briefing in which the study results will be presented at NASA Headquarters in Washington, D.C. The contractor will be required to deliver draft copies of the study for review prior to the briefing.

Twenty-five copies of the final study results are required.

GENERAL INSTRUCTIONS FOR PREPARATION OF PROPOSALSI. TECHNICAL PROPOSAL

Your proposal should be specific and complete. Elaborate format and binders are not necessary. While it is realized that all factors cannot be detailed in advance, your proposal should demonstrate a thorough understanding of the requirements and a logical plan for solving problems set forth in the STATEMENT OF WORK outlined in ATTACHMENT 1. It should include, where applicable, sketches, drawings, curves, charts, and a complete explanation of the procedures you propose to follow. Your technical proposals must be completely separate from your cost proposals so that they may be evaluated by NASA strictly on the basis of technical merit.

The following specific information concerning the capabilities of your firm to perform this work is required. It may be arranged to suit your requirements, using the tabulation below as a guide to content; rather than form. Based on the information you furnish, NASA's technical evaluation team will consider the following:

- A. Demonstrated understanding and knowledge of the scope of work as shown by the scientific and technical approach proposed.
- B. Technical approach to be undertaken in conducting the feasibility study, appreciation of the technical compromises and trade-offs which must be examined as well as novel ideas in the technology proposed.
- C. Resumes of all key personnel to be assigned, including educational background, work experience, and length of service with your firm, including actual duties previously performed by the individual as related to this solicitation.
- D. A schedule indicating how soon after award of a contract the key personnel could be actively assigned to the project.
- E. A brief description of your firm's organization, including an organizational chart.
- F. Manpower and Industrial Resources of your firm.
- G. A brief discussion of projects for which you have provided services similar to those required for this project including for each such project:

1. Description of work and difficulty of subject matter.
Charts and other documentation may be furnished.
2. Name and address of customer or client, including individual contact.
3. Approximate dollar value.
4. Contract number and period of performance for Government contracts.
5. Whether your firm acted as prime contractor or as a subcontractor.
6. The percent of the project performed by your own work force and the percent performed by others.
7. Name of project manager.

H. Any additional information which you feel may assist in evaluating your interest in and capability for undertaking this project.

II. COST PROPOSAL

Your cost proposal should be complete and separate from the technical proposal required in Part I. above. It is anticipated that two or more fixed price contracts will result from this Request for Proposal. Based on the STATEMENT OF WORK outlined in ATTACHMENT 1, you are requested to propose your fixed price for providing these services. Your proposal should contain a cost summary for which the format below is recommended, supported by such information as is needed to fully explain the proposal.

A. Direct Labor

(Itemize by employee classification,
showing for each classification the
labor hours and hourly labor rates)

\$ _____

B. Overhead

\$ _____

C. Other Direct Costs

Material (itemize)

\$ _____

Travel

\$ _____

Consultants

\$ _____

D. General and Administrative Expense

\$ _____

E. Total Cost

\$ _____

F. Profit

\$ _____

G. Total Price

\$ _____

In addition to your cost proposal, provide information regarding the financial stability and resources available to your firm, including summary financial statements for the past two years.

III. EXECUTION OF CERTIFICATES AND STATEMENTS

Finally, execute and submit with your proposals the attached Certificates and Statements.

A. Size of Business Statement

B. Contingency Fee Statement

C. Equal Opportunity Certificate

D. Buy American Certificate

E. Current Pricing Certificate

F. Certificate of Independent Price Determination

THE BIDDING DOCUMENTS:

1. That the bidder is a dealer in, manufacturer of, or supplier of _____.
2. (a) That he, _____, has not, employed or retained any company or person (other than a full time bona-fide employee working solely for the bidder or offeror) to solicit or secure this contract, and (b) that he, _____, has not, agreed to pay to any company or person (other than a full time bona-fide employee working solely for the bidder or offeror) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract; and agrees to furnish information relating to (a) and (b) above as requested by the Contracting Officer. (For interpretation of the representation including the term "bona-fide employee", see Code of Federal Regulations, Title 44, Part 150).

NOTE: If the bidder or offeror, by checking the appropriate box provided therefor in his bid or proposal, has represented that he has employed or retained a company or person (other than a full time bona-fide employee) to solicit or secure this contract, he may be requested by the Contracting Officer to furnish with his bid or proposal a completed Standard Form 119 (Contractor's Statement of Contingent or Other Fees for Soliciting or Securing Contract). If the bidder or offeror has previously furnished a completed Standard Form 119 to the office issuing this bid or request for proposals, he may accompany his bid or proposal with a signed statement, in lieu of Standard Form 119, (a) indicating when such completed form was previously furnished, (b) identifying by number the previous IFB, RFP, or contract in connection with which such form was submitted, and (c) representing that the statements in such previously furnished form are applicable to this bid or proposal.

3. (a) That he is _____, is not _____, a small business concern. For the purposes of Government procurement, a "small business concern" is a concern, including its affiliates, which is independently owned and operated, is not dominant in the field of operation in which it is bidding on Government contracts, and can further qualify under the criteria set forth in regulations of the Small Business Administration (See Code of Federal Regulations, Title 13, Part 121.3.6).

(b) If he is a small business concern and is not the manufacturer of the supplies offered, he also represents that all supplies to be furnished hereunder _____ will, _____ will not, be manufactured or produced by a small business concern in the United States, its Possessions, or the Commonwealth of Puerto Rico.

4. That he _____ has, _____ has not, participated in a previous contract or subcontract subject to either the Equal Opportunity Clause herein or the clause originally contained in Section 301 of Executive Order 10925; that he _____ has, _____ has not, filed all required compliance reports; and that representations indicating submissions of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontract awards. (Not applicable if resulting contract will be exempt from Equal Opportunity Clause).

5. And hereby certifies that each end product except the end products excluded below, is a domestic source end product (as defined in the Contract clause entitled "Buy American Act"); and that components of unknown origin have been considered to have been mined, produced, or manufactured outside the United States.

EXCLUDED ITEMS: _____.

Contract/bid/proposal
number: _____

(Name of Company or Individual)

Date _____

BY _____

(Signature)

(Printed name)

(Title)

CERTIFICATE OF CURRENT COST OR PRICING DATA* (DECEMBER 1964)

This is to certify that, to the best of my knowledge and belief, cost or pricing data submitted to the Contracting Officer or his representative in support of _____ ** are accurate, complete, and current as of the date of execution of this certificate.

Firm _____

Name _____

Title _____

Date of Execution

- * For definition of cost or pricing data see NASA PR 3.807-3(1).
- ** Describe the proposal, quotation, request for price adjustments, or other submissions involved, giving appropriate identifying number (e.g., RFP No. _____).
- *** As a general rule, this date should be the date when the contract price was agreed to. It is not intended that personal knowledge of the contractor's negotiator limits the responsibility of the contractor if the contractor has available at the time of the agreement information showing that the negotiated price is not based on accurate, complete, and current data. Contractors are expected to make a reasonable check to ascertain whether the concern had any information not personally known to the contractor's negotiator at the time of the agreement and in accordance with NASA PR 3.807-3 should be disclosed to the Contracting Officer for his consideration. Contractors are not expected to make a complete recheck of all data or develop a new cost estimate after the date of agreement and prior to execution of the contract. However, execution of a Certificate of Current Cost or Pricing Data is not intended to relieve a contractor of the responsibility for disclosing circumstances or events, happening subsequent to the date of certification but known to the contractor prior to the date of contract execution, which could reasonably be expected to have a significant bearing on costs under the proposed contract.

CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (JUNE 1964)

(a) By submission of this bid or proposal, each bidder or offeror certifies, and in the case of a joint bid or proposal, each party thereto certifies as to its own organization, that in connection with this procurement:

(1) The prices in this bid or proposal have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or offeror or with any competitor;

(2) Unless otherwise required by law, the prices which have been quoted in this bid or proposal have not been knowingly disclosed by the bidder or offeror and will not knowingly be disclosed by the bidder or offeror prior to opening, in the case of a bid, or prior to award, in the case of a proposal, directly or indirectly to any other bidder or offeror or to any competitor; and

(3) No attempt has been made or will be made by the bidder or offeror to induce any other person or firm to submit or not to submit a bid or proposal for the purpose of restricting competition.

(b) Each person signing this bid or proposal certifies that:

(1) He is the person in the bidder's or offeror's organization responsible within that organization for the decision as to the prices being bid or offered herein and that he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above; or

(2) (a) He is not the person in the bidder's or offeror's organization responsible within that organization for the decision as to prices being bid or offered herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above, and as their agent does hereby so certify; and (b) he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above.

(c) This certification is not applicable to a foreign bidder or offeror submitting a bid or proposal for a contract which requires performance or delivery outside the United States, its possessions, and Puerto Rico.

(d) A bid or proposal will not be considered for award where (a)(1), (a)(3), or (b) above has been deleted or modified. Where (a)(2) above has been deleted or modified, the bid or proposal will not be considered for award unless the bidder or offeror furnishes with the bid or proposal a signed statement which sets forth in detail the circumstances of the disclosure and the Administrator, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

Name of Company

Signature

Date

Title

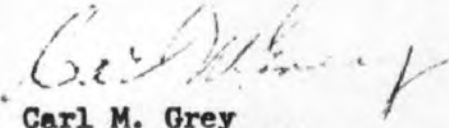
ADDENDUM NO. 1

TO

REQUEST FOR PROPOSAL NUMBER BCS-10-6642

Any contracts awarded as a result of this Request for Proposal will contain a provision that all information, data, drawings, etc., generated thereunder, will be considered "Subject Data" for purposes of the meaning and intent of Clause 23 of General Provisions, NASA Form 247 (March 1965) attached.

Additionally, the successful proposer shall have no claim or vested right to any follow-on procurement for further study, development, or implementation for the Voice Broadcast System.


Carl M. Grey
Contracting Officer

JANUARY 17, 1966

GEORGE P. MILLER, CALIF., CHAIRMAN
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1/17
ACTION COPY TO E. DIR/Kline
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COMMITTEE ON SCIENCE AND ASTRONAUTICS

HOUSE OF REPRESENTATIVES

SUITE 2317-2325 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, D.C.

January 12, 1966

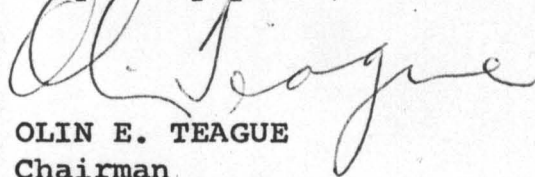
CHARLES F. DUCANDER
EXECUTIVE DIRECTOR AND
CHIEF COUNSEL
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FRANK J. GIROUX
DENIS C. QUIGLEY

Dr. Wernher von Braun
Director
George C. Marshall Space Flight Center
National Aeronautics and Space Administration
Huntsville, Alabama 35812

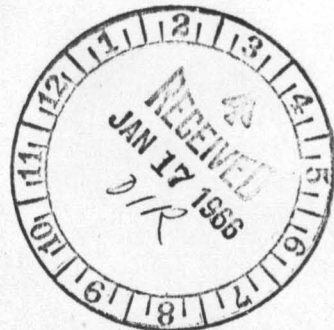
Dear Dr. von Braun:

Enclosed is a revision of the "Requested Data
for Hearing" which was mailed to you with my
letter of January 7, 1966.

Very truly yours,



OLIN E. TEAGUE
Chairman
Subcommittee on
Manned Space Flight



COMMITTEE ON SCIENCE AND ASTRONAUTICS

Subcommittee on Manned Space Flight

Requested Data for Hearing

Data listed below is requested so as to provide sufficient uniformity of presentation to utilize the brief time available.

A. Management, program and fiscal information presented in a standard format for all Centers.

B. Funding data related to previous fiscal years (1964, 1965) on a consistent basis, including any realignment of 1966 funds and 1967 budget planning.

C. Information presented in summarized form with an analysis of appropriate portions.

D. Data in such form as to be reconcilable with NASA headquarters budget summaries.

It is requested that data outlines in the remainder of this enclosure be presented by the Center to the Subcommittee during the hearings. These statistics should be in summary form with sufficient written analysis for clarity. The Center is not limited to the data requested and should include additional information as required. Where information cannot be presented in the time available it may be in such form that it can be placed in the record of MSF Subcommittee hearings on the F. Y. 1967 NASA authorization bill.

I. Programs and Projects (in summary form with subdivision by major programs).

a. Fiscal

- (1) 1967 budget allocations by major programs with consistent comparable budgets for fiscal years 1964, 1965, and 1966, including current total cost to completion estimates for each major program.
- (2) Analysis of fiscal year 1966-1967 budget realignments by programs.
- (3) Actual vs. planned expenditure by programs for fiscal years 1964, 1965, and 1966 (to date).

- (4) Budget requested by Center for fiscal year 1967, amount reduced and final budget.
- (5) "No-year" funds carry over by programs for fiscal years 1963, 1964, 1965.
- (6) List of R&D contracts in order of dollar value currently in force.
- (7) List of construction contracts with estimated completion date and total costs.

b. Procurement for research and development

- (1) Number of procurement plans submitted to Center Director (less than \$5 million).
- (2) Number submitted to NASA headquarters (more than \$5 million).
- (3) Exceptions to (1) and (2) above.

c. Contracts (calendar year 1965)

- (1) Number of competitive participants in each R&D negotiated contract.
- (2) Fixed price contracts converted to CPIF.
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- (4) Contracts to a review board to determine final fee.
- (5) Organization identification of contract approval authority (organization level and type of authority).
- (6) Contracts renegotiated.
- (7) Percentage of contracts to small businesses.

d. Facilities

- (1) Furnish information to show the status of facility planning, design and construction for fiscal years 1964-1965, 1966, 1967 and future years when incrementally funded. Provide fiscal data to include unobligated balances as of January 1, 1966. (An

unobligated balance exists for this purpose when available funds are not obligated to a contract or work order to another government agency).

- (2) Furnish a listing of cost-plus-fixed fee contracts entered into for facility management, services and construction. Provide information as to the purpose of each.
- (3) An estimate of future construction fund requirements for facility together with a general description of probable work.

II. Management

- a. Changes in organization chart from 1965 with identification of mission relationship of each major subarea.
- b. Number and cost of contracts administered by other government agencies, with agencies identified in 0 - \$100,000, \$1,000 - \$500,000 and over \$500,000 groupings.
- c. Percent of overtime of total time on individual projects or programs over \$50,000.
- d. Average annual cost of each direct Center employee with comparison to previous year.
- e. A listing of each support contract pertaining to the facility, together with:
 - (1) The annual estimated cost and the duration of the current contract.
 - (2) Name and corporate address of contractor.
 - (3) Number of personnel employed by contractor under support contract.
 - (4) Functions performed by contractor under support contract.
 - (5) Average annual salary of contractor employees used on support contract.
 - (6) Amount of overtime involved annually.
 - (7) Amount of subcontracts placed annually by support contractor.

GEORGE P. MILLER, CALIF., CHAIRMAN

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OLIN E. TEAGUE, TEX.
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COMMITTEE ON SCIENCE AND ASTRONAUTICS

HOUSE OF REPRESENTATIVES

SUITE 2317-2325 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, D.C.

January 7, 1965

Dr. Wernher von Braun
 Director
 George C. Marshall Space Flight Center
 National Aeronautics and Space Administration
 Huntsville, Alabama 35812

Dear Dr. von Braun:

The Subcommittee on Manned Space Flight again is planning to hold hearings at the NASA Centers. This schedule will be arranged with you through the NASA headquarters Legislative Affairs Office.

A copy of a letter to Dr. George E. Mueller on the same subject is enclosed. In addition, a second enclosure outlines several requirements to allow the most effective utilization of the minimum time available for hearings. These requirements are considered a minimum and do not restrict the presentation of additional information required for clarity. A verbatim stenographic transcript of these hearings is requested. In the event that hearings are not held at the Center, the requested information may be furnished for inclusion in the Manned Space Flight Subcommittee hearings on NASA's FY 1967 authorization bill.

Your effort in this planning will assure effective hearings in the brief time available.

Very truly yours,

Olin E. Teague
 OLIN E. TEAGUE
 Chairman
 Subcommittee on
 Manned Space Flight



Subcommittee on Manned Space Flight

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- d. Average annual cost of each direct Center employee with comparison to previous year.

9/8/17

B 1/24

S-II-T Stage and GSE - All bolts in the forward skirt have been torqued. Repairs to the membrane seal are complete, and reinstallation of systems in the forward skirt is progressing. All side wall insulation repairs and the proof pressure test of the insulation are expected to be complete by the end of next week. The single-point ground test of the stage was completed with no major problems. The stage control wiring is complete, excepting MOD kits, and the stage is ready for power. Installation and checkout of GSE appears to be most likely to impact the S-II-T firing, with the C7-800 the pacing item. ✓

S-II Test Stand A-2 - The electro-mechanical check of the facility LH2 system is in progress and cold shock of the system is expected next week. ✓

S-II Test Stand A-1 - Late delivery of steel has already impacted the availability of the test stand by an estimated four weeks, and the situation threatens to become worse. The MTF Site Manager and a representative of the Corps of Engineers will visit the supplier, Capitol Steel of Houston, Texas, next week to try to remedy this problem. ✓

S-IC Test Stand and TCC - Erection of steel for the center pier is in process through the 19th floor. Poured west pier, south half, to elevation 155'. RCA began installation of the RCA 110A computer in the TCC on 1/10/66. ✓

Technical Systems - Revised Boeing need dates for completed Phase II tech systems on the S-IC Test stand are being reviewed in light of present access dates. Only selected acceleration is expected to be required. ✓

Propellant and Pressurant Systems - The high pressure gas and control systems for the S-IC Booster Storage Building were turned over to Boeing on 1/12/66. The Corps of Engineers was furnished a complete scope of work for propellants and high pressure gas line cleaning on 1/10/66. ✓

Board of Trustees of State Institutions of Higher Learning of Mississippi has appointed a special committee to give consideration to the establishment of appropriate educational opportunities in the Gulf Coast area as a result of a visit made by MTF representatives several weeks ago. ✓

Hancock County Airport Master Plan - was presented by consulting engineers and planners for the Hancock County Port and Harbor Commission on 1/13/66 at a meeting in which MTF was represented. The recommended location of the airport was in the MTF Buffer Zone near Kiln, Mississippi. ✓

1/17 JB

B 1/24

RL10 ENGINE The weight saving performance improvement features have successfully completed environmental and endurance substantiation requirements. Engineering changes are in the approval cycle for incorporation of these features in the initial RL10A-3-3 production engines.

A development program has been initiated to eliminate inducer rubbing (steel on aluminum) in the RL10A-3-3 LOX pump. Although inducer rubbing has not caused a problem in 700 engine firings, it is considered undesirable. Corrective actions under consideration include increased clearance, inducer offset, and a Kel-F rub insert. ✓

Testing has been initiated on the dual engine E-5 test stand to evaluate operational sequencing of the Centaur AC-8 vehicle. ✓

F-1 ENGINE Thru January 12, 1966, 1,277 R&D engine system tests for a total of about 91,692 seconds have been conducted. Of these, 430 tests were for full duration with 143 exceeding 160 seconds.

On January 7, 1966, a failure occurred, on ignition during testing of an experimental injector (X051) on test stand 2A-2. The injector was tested in a tube walled thrust chamber. One side of the LOX dome and injector was burned away with some damage to the thrust chamber. Very light stand and facility damage was incurred. This was the first time that ethylene glycol prefill was used on this stand and the first time a 1/4 wave tube was used to reduce facility feed line oscillations. The cause of this failure is not known at this time, but is presently being investigated. ✓

Rocketdyne is presently negotiating with the United Auto Workers Union for a contract covering the Rocket Engine Test Site at Edwards Air Force Base, California. The possibility of a strike is high. In case of a strike, plans have been made to minimize the impact by the use of non-union employees. ✓

Negotiations for conversion of the F-1 deliverable hardware contract (NAS 8-5604) from CPFF to CPIX were successfully completed on January 11, 1966. ✓

J-2 ENGINE A complete J-2 engine was vibrated on the Rocketdyne 30K shaker table during December. The engine will be hot fired as soon as a test stand position is available. ✓

The first engine for S-II 503 was delivered to S&ID this week. ✓

The S-IVB Battleship tank has arrived at South Pittsburgh, Tennessee. The tank is presently being transferred to a trailer for transporting to AEDC. Test Lab is providing major support in the unloading and moving in the form of equipment and operators. ✓

A pre-negotiation presentation concerning the J-2 R&D extension, 52 additional production engines, and contract combination, was made to Dr. Mueller January 11, 1966. Approval for the 52 engines incentive structure was received by MSFC January 13, 1966. An R&D incentive structure is expected next week. ✓

H-1 ENGINE In reference to the LOX pump shaft seal problem reported during the SA-201 Preflight Review, the status of corrective measures is listed: (a) Retrofit of second cavity drain line -- accomplished on SA-201 and SA-204; (b) Removal of cup gasket -- accomplished on the effective engines, i.e., SA-206 and subsequent; (c) Testing of turbopump to determine exact seal environment -- both engine and component tests are underway; (d) Development testing of a re-designed seal carbon element -- seals have arrived at Rocketdyne and testing will begin immediately. ✓

The recommendation to launch SA-201 on schedule remains unchanged. ✓

The program impact of damage to the thrust chamber braze furnace sustained when the bell was dropped during a lifting operation is limited to the cost necessary to restore the furnace. The repair is estimated to take 35 days. ✓

NEGATIVE REPORT

NOTES 1-17-66 CLINE

1/17 KB

B 1/24

9/8/17

B 1/24

1. S-IC-F

On Friday, January 14, 1966, the S-IC-F was loaded on the barge Poseidon for shipment early Saturday morning, January 15, to the Kennedy Space Center. ✓

2. HURRICANE BETSY REPAIRS COMPLETED AT MICHLOUD

Tri-State Roofing Company and J. A. Jones Construction Company satisfactorily completed repairs to the Michoud Assembly Facility necessitated by Hurricane Betsy. Final inspection of the work was held on Thursday, January 13, 1966. ✓

NOTES 1-17-66 DANNENBERG

NS 1/17

B 1/24

Negative Report

NOTES 1/17/66 FELLOWS

B 1/24

- 1/17/66
1. Apollo Logistics Support: General Phillips has approved the Apollo Logistics Requirement Plan (formerly NPC 500-X). In the preface, General Phillips states, "This document has been developed to meet the urgent need for an integrated logistics support system for the Apollo Program." In implementation of that Plan, Mr. F. Waller, Chief, Apollo Logistics, NASA Headquarters, held a meeting last week at KSC for development of the Logistics Plan. My office represented R&D Operations at the meeting. Principal subjects discussed were maintenance analysis, maintenance manual requirements, spare parts, training, requirements for positive logistics support at the launch site, and the required responsiveness to documentation requirements arising from the heavy launch schedule. ✓
 2. 25-Ton Crane for Test Transportation Hanger: To accomplish the refurbishment and modification of Saturn V swing arms, in accordance with a \$2.5 million task assigned to MSFC by KSC, two 25-ton bridge cranes are required in the Test Lab Transportation Hanger for handling and positioning the swing arms. One crane was approved in the FY-65 C of F Plan for the Transportation Hanger, which has just been completed. The requirement for the second crane was questioned by Mr. Diaz, MSF. After considerable justification by MSFC, Mr. Diaz has finally agreed to the installation of the second 25-ton crane. This crane will be available in June, which will be in time to meet KSC schedules. ✓

NOTES GEISSLER

1/17/66

B 1/24

9/8/17

1. Flight Mechanics Panel: The Fifteenth FMP meeting was held at MSFC on January 11 and 12, 1966. Some of the highlights of the meeting are briefly summarized as follows: (a) An extensive presentation of the L/V venting characteristics was given by R-P&VE-P; (b) An EDS Sub-Panel has been proposed under the FMP for EDS limits determination, abort displays, etc.; (c) The AS-201 pre-launch wind monitoring program was presented; and (d) The orbital attitude timeline requirements are being firmed-up for programming in the on-board computer. ✓
2. Shell Flutter: In an Air Force Research Program, presently underway at AEDC, interesting results have been obtained concerning the aerodynamic flutter of cylindrical shells. Up to the present time, shell flutter has been universally regarded as nondestructive. During this test program, two out of three test specimens were destroyed in approximately one second, by "explosive" shell flutter. We are not forecasting any such difficulties for Saturn vehicles but the message from such findings is that one has to remain cognizant of these phenomena to avoid risky designs by oversight. ✓
3. Mississippi Test Facility Weather Radar: Our Aerospace Environment Office has made the necessary arrangements with Department of Defense for obtaining a suitable radar set for MTF at no cost to MSFC. MTF funds for this item were thereby made available for other MTF needs. Although our workload temporarily increased due to the coordination of this acquisition, the monetary savings made it worthwhile. ✓
4. Weather Satellite Picture Reception: Our automatic picture transmission ground station for use in receiving pictures direct from Tiros and Nimbus satellites is operational, based upon a recent ground checkout. The unit will be used to obtain meteorological research data and a better understanding of potential AAP problems concerned with remote sensing. Complete operation now awaits the launch of the Tiros operational system the last of this month and a Nimbus satellite in March. ✓

B1/24

Q2 1/17

1. S-IC-1 CHECKOUT: Checkout has been completed on the S-IC-1 stage except for a few minor cleanup activities which should be completed by the time the stage is transferred to Test Laboratory today (1-17-66). The accomplishment of checkout on this stage has been most difficult due to hardware shortages. Delivery of critical shortage items was accomplished only through the concentrated expediting efforts of Manufacturing Engineering Laboratory, Boeing and this Laboratory. ✓
2. ULTRASONIC TESTING: Due to the failure of radiography to detect certain weld defects, this Laboratory initiated development of a supplementary inspection system. Ultrasonic devices, commercially available for production use, utilized manual techniques which were too slow to test, in a reasonable time, the hundreds of feet of weld in an S-IC stage. Accordingly, this Laboratory developed a mechanical ultrasonic scanning system which employs a water column probe with the capability of flexible contact for precise coupling, and the fast scanning rate required. Calibration techniques and a precision probe alignment fixture were also developed. This equipment in conjunction with automatic radiography tooling available at welding sites and some commercial ultrasonic instrumentation comprise the system. With the completion of MSFC S-IC fabrication efforts, it is planned to provide the system to Michoud for use on gore welds. ✓
3. AUTOMATIC DATA HANDLING SYSTEMS: Computer programs have been completed for the automatic document and data handling system used for storage of test data and for controlling, improvising and producing test procedures. Test data can now be retrieved from an IBM 1410 computer in any format required and test procedures can be revised and re-issued in approximately 40% of the time previously required. ✓

D.G.

Please
show me
this
installation

B

NOTES 1/17/66 HAEUSSERMANN

B 1/24

9/8/17
1. LVDC/LVDA DELIVERY STATUS: The 202 flight LVDC and LVDA (S/N P-4) arrived on 1/10. The units were functionally checked and were delivered to IBM-Huntsville at 2 p.m. on 1/12 for installation in IU 202. ✓

2. DIFFICULTIES DURING OVERALL TESTS WITH 201 AT KSC: At the request of L. Richard and Colonel James, on the morning of 1/15 a group of specialists was sent by special plane to KSC to assist in trouble-shooting. The group consists of two specialists on the DDAS system, one on the countdown clock, one from Aden's integration group, and three Chrysler personnel experienced on the IB Breadboard. ✓

3 1/24

958 1/17

S-IC-T

The S-IC-T is scheduled for removal from the test stand on January 18 or 19, 1966. Installation of the S-IC-1 stage is scheduled for January 24, 1966. ✓

S-IC-D

The S-IC-D stage was installed in the Dynamic Stand on January 13, 1966. ✓

S-IB-4

Test SA-32 (short duration) initially scheduled for January 14, 1966, at 4:40 p.m. was re-scheduled for 5:30 p.m. after trouble developed in the thrust vector control system on Engine Position No. 3. Since the discrepancy could not be corrected in time, the test was finally cancelled for inclement weather and is now re-scheduled for January 17, 1966, at 4:40 p.m. ✓

S-IVB (MSFC)

An LH₂ loading test was conducted on January 12, 1966. The objective of this test was to checkout the KSC type LH₂ topping system. The objectives were successfully met and the system operated satisfactorily. ✓

S-IVB-202

The stage has completed post-static checkout and will be loaded for shipment to KSC January 15, 1966. ✓

S-III BATTLESHIP (SANTA SUSANA)

A successful 354 seconds duration firing was conducted on January 12, 1966. Cutoff was manually when the automatic 1% lox low level did not initiate cutoff as planned. A successful "hot" gimbal program was conducted from 18 to 180 seconds. A nominal 5.0 mixture ratio was run for 300 seconds, then raised to 5.5 mixture ratio. ✓✓

NOTES 1-17-66 HOELZER

B 1/24

1/17

THIRD GENERATION COMPUTER PROCUREMENT STATUS: The bidders conference was held as scheduled on Wednesday and Thursday, January 12 and 13. Tours were held of the computer facilities at Slidell and Huntsville. A question and answer session at Huntsville on January 13 terminated the conference. ✓

INCENTIVE CONTRACTS: Dr. Mueller approved our negotiating position on the CCSD incentive contract last Tuesday. We think we have a good position with CCSD and negotiations are under way to convert this contract. Dr. Mueller also approved a modification to the previously approved DAC negotiating position and authorized us to proceed with the finalization on this contract. Our goal of reaching final agreements with the contractors by the end of this month on the conversion of the contracts looks well within reach. ✓

I. U.: We had a meeting with IBM, Dr. Haeussermann, Fred Cline, and others to conduct a detailed review of the I. U. -203 status last Friday. The primary objectives of this review were to identify the work yet to be done, evaluate the outstanding changes and determine actions necessary to bring the I. U. -203 back to an acceptable schedule position. IBM is projecting about a 6 week slip. This slip does not include all of the changes MSFC has identified for incorporation into I. U. -203. I feel this situation is extremely critical for two reasons: 1. The timely execution of the SA-203 mission is critical if it is to produce useful Saturn V/S-IVB design data; and 2. With the spacecraft delivery problems reflecting later deliveries, Headquarters may push for a SA-203 launch ahead of SA-202. We took some actions in this meeting which will delay the incorporation of certain changes to later I. U. 's and thereby result in slight improvements to the schedule, however, the total problem is not resolved. We will continue to investigate ways to improve this situation but it is clearly evident that we cannot consider additional changes and must, in fact, eliminate more of the changes which have been previously approved for SA-203. ✓

EXPERIMENT PAYLOAD CAPABILITY: We have progressed to the point that we have a very adequate design margin on AS-204 through 207. In addition to the design margin, we have 1300 lbs. on AS-205 and 250 lbs. on AS-206 available for experiments but not currently being used at this time. We could probably use some of the AS-207 design margin also for experiments if they are available. The lag in experiments development concerns me because MSFC has worked hard and spent a considerable amount of money to develop the Saturn IB capability and I think we should utilize it.

SATURN IB ESE: You are probably aware that for some time we have been considering a total move of the Saturn IB ESE to Daytona. At the present time manufacturing only has been moved. I have had the intuitive feeling that to collect the Saturn IB at Daytona and the Saturn V at Huntsville would be a good thing. The recommendations of Dr. Lanzkron and Bob Aden have been to the contrary. In view of these recommendations and the fact that there is nothing concrete to substantiate the move, we made the decision last Friday to collect all of the Saturn IB and Saturn V ESE at Huntsville at a future date. ✓

Larry
McCall

B

QTB 11/17

1. Completion of S-IC-502: The assembly of the second S-IC flight stage has been completed in our shop on schedule. ✓ Delivery of the stage is taking place this morning while S-IC-501 is being returned to our shop for refurbishment and up-dating prior to shipment to Test Laboratory which is scheduled for January 24, 1966. There are still a number of shortages existing on -502, in the order of 120 line items, of which 46 are CAM created components. Delivery of these latter components at a later time has been previously agreed upon by the Change Control Board. All engine injector plates have been exchanged on this stage. The remaining workload for installation of missing components is estimated to be in the order of 3,000 manhours. It can be stated that this stage is more complete than -501 had been at transfer to QUAL Laboratory in September last year. The IO Stage Manager's Office and QUAL Laboratory have agreed to ship and accept -502 with the known shortages. ✓

2. Cleaning Conference: A cleaning conference sponsored by the Manufacturing Engineering Laboratory on January 11 and 12, 1966 was attended by approximately 205 representatives from MSFC, MSC, KSC, prime contractors and industry personnel working in related fields. Fourteen papers were presented by MSFC, MSC, and contractor industry personnel. The topics dealt with problems in contamination control and cleaning of such varied systems and hardware as the Gemini spacecraft, Apollo systems, Saturn V tanks, valves, LOX suction lines, pressure bottles, filters, tubing, and ground support equipment. A question and answer period provided a forum for discussion of problem areas. The meeting was then summarized by a conference panel. During this conference, problem areas were defined which affect the present Saturn and Apollo vehicle and require resolution. Mr. Condon from NASA Headquarters was the speaker at the banquet on January 11, 1966. ✓


B 1/24

9/8/17

APOLLO COST STUDY UPDATE - Mr. Frank Rosenberg, contact on the Apollo Cost Study, visited Marshall on January 13 and 14 to discuss the guidelines and schedule for this task. During this visit an agreement was reached on a firm set of guidelines and definitions, incorporating comments by Marshall, under which the study will be conducted. ✓

The major controversy involved the schedule for completion of the study. Marshall, in a letter to Dr. Mueller, proposed a completion date of May 13, while Mr. Hilburn desired a completion date of March 26. The latter date was based on using the study results as a base in preparing the preview memo on FY-68 requirements for AAP to BOB due May 1. Mr. Rosenberg proposed a compromise that MSFC submit partially available and approved data by April 8, with the balance of information to be forwarded when the study by Marshall is completed. A review is underway on this proposal, both at Headquarters and at Marshall, in an attempt to arrive at a compromised schedule. ✓

attached CONGRESSIONAL MATTERS - On January 13, we received Congressman Teague's letter addressed to you forwarding his annual list of questions on management, funding, facilities and contracts. The only significant addition to questions asked last year is a request for future projection of facility requirements. The official date for the Committee visit to MSFC, Michoud and MTF is still February 3 - 6, but this date has become increasingly soft due to other priorities in Congress. ✓



H.M.

Let's talk about this.
Staff Luncheon 24 Jan.
B

NOTES - 1/17/66 - RICHARD

1/17/66

B 1/24

No submission this week.

B 1/24

Q10 1/17

1. S-IC Stage:

S-IC-D Stage - moved from R-ME to dynamic test stand on Thursday, 13 January 66, as scheduled. ✓

S-IC-F Stage - departed Michoud on Friday, 14 January 66, for KSC as scheduled. ✓

S-IC Project Quarterly Review - will be held at Michoud on Wednesday, 26 January 66. ✓

2. S-II Battleship Stage - was tested at approximately 2:30 pm, CST, on Wednesday, 12 January 66. Duration of test was approximately 354 seconds (350 second plus planned). Test results were:

- LOX recirculation system very satisfactory. ✓
- Sideload arresting mechanism (slam) functioned as planned. ✓
- The 5.5 mixture ratio functioned satisfactorily during the last 25 seconds of test as planned. ✓
- Engine gimbaling test functioned very satisfactorily. ✓
- LH₂ recirculation system was unsatisfactory. Two recirculation pumps malfunctioned and overboard bleed was used to accomplish test.
- LOX depletion cutoff failed to function automatically - Indication lights turned on at 1% LOX level and cutoff was accomplished satisfactorily. Cause not known at this time. ✓

Next firing (200 seconds duration) scheduled for Wednesday, 26 January 66. ✓

3. Saturn V Operational - Display Systems Status:

- First system delivered to Astrionics Laboratory on Wednesday, 12 January 66.
- Installation to be by Sanders Associates, Inc.
- Indicated delivery date for Display Systems to LC-39 is 17 March 66, installed and checked-out.
- Efforts currently underway to improve the delivery date to LC-39 to 1 March 66. ✓

P.R.
Action?
B

NOTES 1/17/66 SPEER

B11/24

1/18/19

1. RANGE SAFETY FOR POLAR ORBITS: KSC has requested that Gen. Huston, Commander AFETR, state policy requirements with regard to Saturn IB launchings into polar orbits from the Cape. Dr. Debus pointed out the need for minimizing the sum total of hazards and, at the same time, affording equal protection to all land masses concerned. Special consideration must be given to the impact of spent stages. In the Operations Executive Meeting on 1/8 Gen. Huston acknowledged NASA's desire to define criteria to be used in removing present operational constraints such as the difficulty of overflying land masses; the requirement for destruct systems; or the need for contingency recovery forces. He agreed to establish a special study group in this area. ✓

2. LAUNCH VEHICLE SUPPORT FROM BERMUDA: A significant part of the S-II burn will not be visible from the Cape. On Saturn V flights Bermuda will be required for decommutation of three PCM links for flight control. The station is presently scheduled to be equipped for only two decoms. We have two solutions: either adding a third decom or compromising requirements by link sharing of a decom. GSFC is investigating the impact. ✓

3. SATURN V SUPPORT REQUIREMENTS: The first edition of the Saturn V Program Support Requirements Document has been received from OSRO for our review. Although still somewhat incomplete this document signals for the first time the existence of the total validated Apollo/Saturn ground support requirements. ✓

4. AS-201 FAILURE INVESTIGATION PLAN: A draft was submitted by MSF to the Centers for comments some time ago. The plan is still not available since Dr. Mueller did not agree. We were advised to wait with developing an MSFC Failure Investigation Plan until a final MSF plan is available. ✓

1. PEGASUS: No substantial changes. ✓

2. AAP: Earth Orbit - I attended, together with several other MSFC members, the AAP Status Review at MSF. A flow chart was presented for experiment development and integration which "leaves nobody out", but is so complex that several attendees questioned its practicality. Several of us were concerned because it dealt only with individual experiments and paid little attention to mission definition, mission analysis, mission integration, systems engineering, support functions, etc. It appears as if the Payload Integration Center has to take the initiative for these important functions. ✓

Flight 507 was presented as a lunar orbit flight. As I learned later, this is not yet certain. ✓

Lunar Exploration - On January 18, RPL will brief Dr. V. R. Wilmarth of OSSA on the lunar surface experiments program. Dr. Wilmarth is expected to be responsible for OSSA's lunar surface science program after the latest realignment of that organization becomes effective. Other Headquarters personnel will also be in attendance. On the same day, also at RPL, will be a meeting of the AAP Mission Planning Task Force - Lunar Surface Missions. Mr. Donald A. Beattie of MSF is chairman of this group. There will be representatives from Headquarters, MSC, and one representative from USGS (Mr. Chidester). Also, we have been informed that Astronaut Cunningham will be present and possibly other astronauts. Ground rules for the AAP Lunar Surface Missions will be discussed and preliminary planning and the assignment of specific tasks for the development of reference missions will be carried out. ✓

On January 19, Dr. Tifft and Mr. Fannin from the University of Arizona will visit RPL to discuss a proposal, "High Resolution Astronomical Imaging and Photometry from a Pilot Lunar Telescope Within the Capabilities of Manned Apollo Systems." Dr. Tifft is a consultant to MSC. ✓

3. FY-66 ART/SRT PROGRAM STATUS:

	<u>Annual Plan</u>	<u>Program Authority</u>	<u>Processed To FMO</u>	<u>Obligated</u>
OART	16,264,000	15,764,000	9,563,256	2,314,284
MSF(904)	8,650,000*	8,650,000*	6,747,172	2,913,404
OSSA	5,903,000	608,000	478,071	198,546
OTDA	1,500,000	1,500,000	705,967	20,356
TOTALS:	32,317,000	26,522,000	17,494,466	5,446,590 ✓

* Reflects \$800,000 reduction effected by Headquarters

NOTES 1-17-66 WILLIAMS

QD 1/17

B⁻1/24

We're working the Workshop problem.

good! B

JANUARY 24, 1966

JTS 1/24

S-II-T Stage and GSE - Side wall insulation repairs were completed 1/14/66. Proof pressure tests showed additional repairs are necessary. Final proof pressure tests are expected next week. Reinstallation of forward skirt mechanical system was completed 1/17/66. Stage leak checks on engine servicing lines were started and are expected to be completed next week. The following stage systems are essentially complete: Engine Servicing, Valve Actuation, Thermal Control, Hydrogen Recirculation, LOX Recirculation, and Electrical Control and Power. Problems with critical GSE are gradually being resolved, but GSE checkout and installation still threatens to delay the S-II-T firing. (S&ID quotes 6 March from MTF Late March)

S-II Test Stand A-2 - Cold shock of the facility LH₂ system was conducted 1/16/66. The test was successful, and only minor leakages occurred.

S-II Test Stand A-1 - Visit of MTF Site Manager and Corps of Engineers representative to Capitol Steel this week disclosed that late delivery of steel will probably continue to be a major problem. However, some improvement in promised delivery dates was effected by this visit. Follow-up will be made next week on this.

S-IC Test Stand - Held joint occupancy inspection on instrumentation and cable chases from mezzanine through the tenth floor on 1/14/66.

Technical Systems, Phase I - A plan for shipment, installation, and checkout of the data handling system in the DHC, whereby the off-line equipment can be utilized to support the S-II-T firing, has been agreed upon by the Government.

Technical Systems, Phase II - Analysis is under way to assess extent of impact of cleaning on installation of LOX, RP-1 and gas control systems in S-IC test stand. Strike at Rome Cable Company is delaying shipment of 22 cables, but no impact on critical program milestones is expected.

Airport Situation - A NASA representative from MTF and city officials of Picayune, Mississippi, met with the Madison County, Alabama, Airport Authority to get its experience with airport operation for use in connection with the proposed Picayune airport.

Gulf Coast Training Institute, Gulfport Mississippi - NASA MTF representatives visited this institution to ascertain its training plans in relation to future personnel requirements at MTF.

Edew

9951/24

RL10 ENGINE

Recent changes in the Atlas/Centaur Project are as follows: *B1/29*
 (1) Three more vehicles (AC-16, 17, and 18) are being procured to handle Apollo landing aids (radar or visual beacon) and/or heavier scientific packages. These three vehicles will use the SLV3C Atlas (elongated tanks) and the uprated RL10 engines in the Centaur stage; (2) Two additional vehicles (AC-19 and 20) will be used in 1969 to launch new Mariner flights to Mars; (3) The first seven payloads (AC-7, 10, 11, 12, 13, 14, and 15) will be engineering model Surveyors with a scanning TV camera and landing dynamics instrumentation. First Surveyor launch (AC-10) is scheduled as a direct ascent flight in May. Main objective is to make a mid-course correction to hit the lunar surface; however, a soft landing will be attempted. A two-burn development stage will be flown in March.

Analog studies indicate that the maximum LOX flow requirement of the engine is greater than the LOX boost pump can supply. No difficulties occurred during actual operation of the combined systems. A test program is underway to map the engine LOX requirements versus boost pump supply. Tests to date indicate the boost pump provides the required flow. ✓

F-1 ENGINE

Test stand 2A-2 (thrust chamber test facility) was returned to service after an experimental injector failure on January 7, 1966. The 400 cps buzz mode was not present when tested with the quarter wave tube. ✓

The damage to T/S 1A caused by the turbopump explosion on R&D engine 029 on December 14 has been repaired and is back in service. ✓

Production engine F-5029 for S-IC-4 has been modified to install a three-piece turbine manifold shroud. A three-piece turbine manifold shroud has also been installed on engine 5030 which is due at RETS for acceptance testing in late January. ✓

The request for proposal for follow-on buy of development effort and thirty-three additional engines is currently being prepared for release within the next ten days, following NASA Headquarters approval of the Procurement Plan on January 14, 1966. ✓

J-2 ENGINE

Negotiations are proceeding on the production portion of the J-2 contract negotiation. Guidelines on the operational development support portion are still being iterated with MSF. ✓

The S-IVB Battleship tank has completed the trip from South Pittsburgh, Tennessee to AEDC. The tank arrived at AEDC at 10:30 a.m. on Saturday, January 22. ✓

A decision has been made to retrofit the one second fuel lead timer into the J-2 engine for vehicles 501, 502, and 503 rather than the S-II vehicle. There will be no schedule impact from this retrofit. Engine electrical control packages are being removed from delivered engines and returned to Rocketdyne for retrofit. ✓

The next S-II Battleship firing has been rescheduled for the first week in February. This is to allow installation of two new stage recirculation pumps, add thermocouples for evaluation of 1/2 inch chill lines and prepare for PU tests. ✓

H-1 ENGINE

The procurement plan which was submitted to NASA Headquarters in August 1965 for procurement of H-1 rocket engines in support of SA-213 and subsequent was approved in late December 1965. Authorization to procure long lead hardware must be given by April 1, 1966 to avoid a production gap.

Following the short duration test of S-IB-4 on January 17, a pin hole leak was discovered on Engine H-4059. A Rocketdyne welder was flown in Tuesday and repair was completed on Wednesday. ✓

GENERAL

The UAW has given notice to Rocketdyne that they will strike at EAFB on January 31, 1966 unless their demands presently under negotiation are met. Rocketdyne will endeavor to continue F-1 testing with no impact on the schedule in case a strike materializes. ✓

NOTES 1-24-66 CLINE

B 1/29

NEGATIVE REPORT

9/8 '129

NOTES 1/24/66 CONSTAN

B1/29

958/ka

MEETING WITH DCAS

A meeting was held on Friday, January 21, 1966, with Colonel Burley, Regional Director, Dallas Defense Contract Administration Services (DCAS) relative to the transfer of quality assurance functions at Michoud Assembly Facility. Colonel Hirsch attended and will brief MSFC management concerning the outcome of this meeting. ✓

NOTES 1-24-66 DANNENBERG

QTS 1/24

B 1/29

NEGATIVE REPORT.

NOTES 1/24/66 FELLOWS

B 1/29

948 1/24

1. Source Evaluation Board Activities: Last week, the Source Evaluation Board, under my Chairmanship, held its first formal meeting for the Computation Laboratory Single Support requirement. The COMP RFP is scheduled for release on January 27, with receipt of the proposals in mid-March and completion of the evaluation late in April. It is expected that the contract will be awarded by June 30. ✓

2. Boeing Space Requirements: Last week, representatives from IO, Astrionics, and Boeing met to resolve Boeing's new requirements for additional office space near the Saturn V Breadboard. It was agreed that, as an interim measure, Boeing would be allowed to use Building 4472 (the small - 2100 sq. ft. - building just north of the Space Museum) for a period of three months. Agreement on more permanent Boeing facility requirements has been deferred for 30 days, pending a further evaluation by IO and Astrionics of Boeing's required manpower level. ✓

3. S-IC-1 and -2 Spares: ME, in coordination with this office, will present to IO management the status of spares for stage-peculiar GSE and flight hardware for the S-IC-1 and -2 stages. Mr. Waller, Chief, NASA Apollo Logistics Office, is expected to attend the presentation, scheduled for January 27. ✓

9/18/1/24

B 1/29

1. Control Studies for the Standard Saturn IB Launch Vehicle: Re: Your question in Notes 1/10/66 Geissler concerning this subject, (copy attached). The following information was obtained in discussions with Astrionics and P&VE personnel: The present H-1 engine actuator was originally designed to the 10 degree limit, but has been mechanically modified to limit its stroke to 8 degrees. The 10 degree limit can be attained by minor modifications to the system and would not be too costly if accomplished early in the procurement and fabrication process. Concerning the flex bellows requalification, it was determined that the present bellows was originally designed for 15 degrees, but the wrap-around lines would require a very detailed analysis. ✓

2. AS-201 Wind Restrictions: A meeting was held 1-19-66 per request of Col. James to clarify the AS-201 wind restrictions prior to the Flight Readiness Review at KSC. The Saturn IB design criteria have been compromised slightly for the AS-201 flight as follows: (1) Launch release restrictions are dictated by MSC structural limitations due to tension considerations in the CM/SM interface (S/C capable of launch in 89.5% probability winds for month of February compared to 95% probability winds specified as design criteria. Launch vehicle meets design requirements). (2) The launch vehicle free-standing capability varies from 93.7% to 99% for the month of February, with the 93.7% capability pertaining to essentially the unfueled condition which occurs in count-down demonstration test held about two weeks prior to launch and the 99% capability pertaining to the completely fueled vehicle ready for launch. The Saturn IB design criteria specifies a vehicle capability to withstand 99.9% probability winds. MSC structural people have verbally stated that S/C meets free-standing design criteria. The launch vehicle restrictions are due basically to structural weakness in S-IB lox tanks, which are carry-over from Saturn I program, and weakness in S-IVB aft skirt. (These two weaknesses are being corrected effective AS-203). (3) The in-flight wind restrictions are the same as those given in MSFC pre-flight review (about 86% probability for February). The launch vehicle is the limiting vehicle component here also. ✓

3. Jupiter Probe: In response to your January 18 request for information concerning launch vehicle requirements for a Jupiter probe, a list of launch vehicles with associated payload capabilities is attached. ✓

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January 3, 1966

Vol. 24, No. 1

Aero
What
launch
Vehicle
does this
require?
Is Titan
feasible
in its
present
form?

WEST GERMANY REPLIES TO JOINT JUPITER PROPOSAL.

A West German aerospace team has completed a design study of a Jupiter probe and is prepared to join President Johnson's proposed European-American interplanetary program (SPACE Daily, Dec. 22). The probe studied would weigh 1300 pounds, take two and a half years to reach Jupiter, and investigate the planet's "red spot". The team made the study for the West German Research Ministry. Johnson made the proposal to West German Chancellor Ludwig Erhard during the Chancellor's recent U. S. visit.

13 BID ON SPACEBORNE MULTIPROCESSING STUDY.

Thirteen companies have submitted proposals on a NASA-Cambridge contract to develop new concepts of multiprocessing oriented to the requirements of future long-range manned space missions. Fourteen invitations were released (SPACE Daily, November 22). Those responding with regard to ERC/R&D 66-92, Spaceborne Multiprocessing Study: Autometrics; Burroughs; GE; Goodyear; Honeywell; Hughes; RCA; Raytheon; Stanford Research Institute; Sylvania; Teledyne; Univac; and Westinghouse.

COMSAT ISSUES RFP FOR NATIONAL SATELLITE.

Declining to speculate on ABC's chance at securing FCC authority to own and operate a communications satellite (SPACE Daily, Sept. 22, Oct. 21, and Dec. 20) but reaffirming its "hope" that such authority is denied (SPACE Daily, May 27), ComSat has revived its plan to orbit a similar satellite for use by companies like ABC (SPACE Daily, June 1) by issuing an RFP for that satellite to 22 American and dozens of foreign firms.

With the FCC decision expected late this month or early next (SPACE Daily, Dec. 20), the appearance of the RFP implies ComSat anticipates a pro-ComSat ruling. The Corporation introduced its national satellite in the wake of ABC's announcement of its intention to seek satellite authority. As described then and now, the proposed ComSat payload would serve the aircraft and maritime industries as well as the television networks. The RFP refers to it as "multi-purpose".

The request is for design study concepts of a satellite whose "communications capacity" is "at least 20 times (that) of EARLY BIRD," ComSat's present communications satellite, which has 240 two-way voice channels or one two-way TV channel. The craft would be put into a synchronous orbit, would operate for at least five years, would weigh about 2300 pounds, and would be primarily powered by solar cells (although nuclear power is to be considered).

MORE

January 21, 1966

Note to Dr. Geissler for Notes to Dr. von Braun

In analyzing present launch vehicle performance capabilities for Jupiter probes (per your request of January 18 re West German Jupiter probe study of 1,300 lbs payload for a 2 1/2 year transfer) we found no present launch vehicle other than the Saturn V to satisfy the required energy of $C_3 \approx 80 \text{ km}^2/\text{sec}^2$. A few pertinent performance points of present and possibly uprated boosters are,

Launch Vehicle	Payload injected at $C_3 = 80 \text{ km}^2/\text{sec}^2$ *
Present Titan IIIC with 2 x 120", 5 segment motors, standard transtage	Negative
Present Titan IIIC with 2 x 120", 7 segment motors, standard transtage	Negative
Titan IIIC with 2 x 156" solid motors, standard transtage	500 lbs
8 Minuteman + S-IB/S-IVB/Hypergolic transtage**	2500 lbs
Saturn IB/Centaur	2500 lbs
Saturn V	20,000 lbs

From this it appears that the launch vehicle in question might very well be a Saturn IB/Centaur or an uprated Titan IIIC vehicle of some kind. We are preparing more detailed information on this for you.

Ernst Geissler

I'd like to have a little chat with you on this subject
1 hr or so. Please arrange thru Bonnie

B/29

* C_3 of $80 \text{ km}^2/\text{sec}^2$ is minimum energy level for Jupiter missions

** Titan IIIC transtage with increased propellant capacity

Thomae, R-AERO-DP

JIS 1/24

B 1/24

1. S-IC CHECKOUT: The S-IC-1 stage completed checkout and was removed from this Laboratory January 17, 1966 for static firing preparations. S-IC-2 was moved into the building for checkout on the same day. The obstacles ahead appear to be similar to those encountered on S-IC-1, that is hardware shortages. The electrical area on S-IC-2 does appear to be more complete than on S-IC-1. Checkout time is 2-1/2 weeks shorter. ✓
2. INSTRUMENT UNIT CHECKOUT: IBM has initiated two 10-hour shifts and will probably work Sundays until completion of checkout of IU-202. At the present rate, checkout should be completed February 5-7, 1966. Due to a recent schedule assessment, (IBM estimates they are six weeks behind schedule) this Laboratory's involvement in checkout of IU-203 will be more substantial than previously planned. It is expected that 13 days will be regained with our additional support. ✓
3. S-II ACTIVITY: Qualification testing has been completed on 159 of 233 S-II flight components. ✓
Monthly meetings between the resident MSFC Quality Office, resident Apollo Quality Office and NASA-O personnel have been initiated to discuss quality programs, problems, etc. at S&ID in an attempt to bring the S-II and Apollo Quality programs at S&ID closer together.
An outline of the present S-II First Article Configuration Inspection (FACI) program and recommendations for revisions to the schedule are being forwarded to the S-II Stage Manager. In general, recommendations are to align the S-II FACI with those on S-IC and S-IVB. ✓
S&ID has prepared a tentative schedule, and began auditing of the quality programs of vendors supplying critical hardware for the S-II program. The schedule is being revised to first audit those vendors having qualification testing problems. ✓
We had previously convinced North American management of the fact that quality control was an overall effort, and thereby generated a complete rewrite of their Quality Control Plan. ✓
North American had also been induced to place total responsibility for vehicle checkout on one person, and quality requirements had been realigned to reflect the criticality of hardware. ✓
4. TRANSISTOR TESTING: A dynamic method for testing the capability of power transistors to function within certain operating areas, without failing because of secondary breakdown and other dynamic phenomena, has been developed and test equipment is on order. The system, called SOAR (Safer Operating Area), will provide this Laboratory with the capability to quickly and economically test and evaluate each transistor through a specified region of maximum transient power that can be dissipated in a transistor during actual operation. For the first time, R-QUAL will be able to identify the most dangerous type of failure, a transistor that will operate satisfactorily for a time and then fail due to some slight degeneration of a small transient. Equipment to start testing should be operational by mid-1966. ✓✓

31/29

1. DAMAGE TO RCA-110A FOR 500FS TEST PROGRAM: The drum memory on the RCA-110A computer was damaged beyond repair at approximately 2:00 A.M. Sunday (1/23). The 110A had been shut down for maintenance and when the maintenance men attempted to bring up power for a final check, the drum was scored so extensively that RCA refused to attempt repairs or to allow power to be returned to the drum. The drum in the SAT I 110 currently located at Test Lab. will be used as a temporary fix. It is hoped that a SAT V 110A replacement drum can be obtained from RCA, Van Nuys. Schedule impact of this incident is as follows: (a) One day lost in the checkout schedule in making SAT I drum operational. (b) Two to three days will be required in having RCA fly a drum in from California.

2. SATURN V 501 SCHEDULES: On 11/18/65, General Phillips held a meeting at MSFC where the SA-501-LC-39 checkout requirements and schedules were discussed. This covered in detail System Development Facility (SDF), LC-39 Facility Checkout and Wet Test, and SA-501 Preparation for Launch. After many compromises and work around solutions, a schedule evolved which showed a 2 month slip against a desired firing date requested by General Phillips. Dr. Rees and Dr. Rudolph defended the schedule as the best that can be done based on our best knowledge. To arrive at the 11/18/65 schedule dates, MSFC agreed to drop the manufacturing GETS check of all the ESE. This is a step MSFC never had taken on any previous program. It was finally agreed at that time to perform this GETS check at the SDF by subsystems with the computer system in the loop. Any change during this test phase is to be reflected into LC-39 equipment immediately. This way the up-to-date LC-39 configuration is established in parallel with the SDF. When General Phillips left on 11/18/65, he made it clear that the schedule was not good enough for him and he wanted to look into it further. ASTR, in collaboration with QUAL, set out immediately to adjust manpower, etc., to meet the agreed upon schedule. We (MSFC) all felt this schedule was extremely tight but it could be met, if no major problems arose. Early in December we were confronted with a new schedule by IO, apparently based on discussions at the Cape between IO, General Phillips and KSC. This new schedule shortened our SDF schedule by 6 weeks, mainly condensed between the already critical time from 2/1 to 7/1/66. Based on the new inputs we tried to come as close as possible to the required schedule, but the realism of this new schedule concerning the SDF operation was very poor. On 1/20, we were again confronted with a new schedule, cutting another 4 weeks out of our SDF schedule and again in the already critical time period. Dr. Rudolph took the new schedule and pressured the responsible people in their respective areas until they agreed reluctantly to the presented schedule change. It has been pointed out to Dr. Rudolph that we cannot agree to the monthly shifts in schedules; work cannot be properly planned and further condensing of schedules (from the one established 11/18) creates unrealistic and impossible workload conditions. We feel the minimum necessary work cannot be done with the new schedules no matter what money and manpower is applied. We agree with General Phillips that a schedule is needed and it must be enforced and maintained but it has to be realistic. We also know we cannot use a schedule not living up to the promises and commitments given to the higher management. ASTR cannot agree to a schedule which is reluctantly agreed to under pressure knowing that it cannot be maintained. Considerable skepticism has developed on this subject since the 11/18/65 review with General Phillips. We feel you should discuss this matter with General Phillips to make him aware that the schedules he has released after 11/18/65 are unrealistic and cannot be supported by the concerned R&DO personnel.

3. ITINERARY FOR WEEK OF 1/24: From 1/25 to 1/27 I will be in New York and Schenectady to participate on the G&C Technical Committee Meeting and Specialist Conference of AIAA and on SPIN PROJECT (cryogenic gyro) review.

Shep

You will remember that I asked Ed O'Connor to advise this situation. I don't know when he plans to do that, but I'm eager to learn what he found, and whether he has contacted Sam Phillips again. Please follow up B

S/S 1/24

B 1/29

S-IC

The S-IC-T stage was removed from the test stand on January 19, 1966. The test stand is ready to receive the S-IC-I stage, which will be installed on January 24, 1966. ✓

S-IB-4

Two static firings were performed this week. Test SA-32 was conducted on Monday, January 17, 1966, at 4:44 p.m. The duration was 35 seconds and the performance was normal and the thrust level of all engines was within specification. Friday morning, a functional checkout of all gimbal systems revealed gas leakage into the oil side on the accumulator of Engine No. 3. This was the fourth gimbal system malfunction on stage S-IB-4. Test Laboratory recommended postponement of the test to correct the system. Due to schedule pressure, CCSD decided to lock the gimbal system on Engine No. 3 out and perform the test with only 3 engines gimbaling. Test SA-33 was then performed on January 24, 1966, at 4:40 p.m. The duration was 147 seconds, from ignition to outboard engine cutoff. The cutoff occurred by lox depletion as scheduled. Performance was normal and thrust level was within specification. The stage is scheduled for removal January 28, 1966. ✓

ASTR
FYI
BS-IVB (MSFC)

Test No. S-IVB-012 was conducted on January 19, 1966. Intended duration was 425 seconds plus, however, the lox pump inlet temperature transducer malfunctioned and the test was terminated at 7 seconds. The main objectives of the test were not met. Test No. S-IVB-013 is scheduled for January 24, 1966, with the same objectives. ✓

S-IVB-203

Propulsion sub-system checkout began on January 17, 1966, approximately one week behind schedule. DAC personnel inadvertently spun the LH₂ recirculation pump necessitating replacing the pump. ✓

The overall pre-static checkout is proceeding about one week behind schedule. ✓

S-IVB-204

The vehicle was received and installed on Beta III on January 15, 1966. An optimistic work schedule has established the acceptance firing date of March 10, 1966. ✓

NOTES 1-24-66 HOELZER

9/24

B 1/29

THIRD GENERATION COMPUTER PROCUREMENT STATUS:

Manufacturer responses to our Request for Proposals for Third Generation Computers are due February 14, 1966. It is fully expected that a good competition will exist. The Source Evaluation Board for this selection is fully implemented. Our plans are that a contract will be realized by May, 1966. ✓

B 1/29

NOTES 1/24/66 JAMES

1/24

SATURN IB FLIGHT READINESS REVIEW, KSC: Dr. Rees, Brig. Gen. O'Connor and other personnel from R&DO and IO attended the AS-201 Flight Readiness Review with me on January 20 and 21. General conclusions of the review were that with the close-out of a few remaining component qualification tests and UCR's, all of which can be closed prior to the presently scheduled launch date, the 201 is ready for launch. The most serious problem at this time is the parity error problem in the GSE computers. We are reviewing possible solutions this week to determine if we can take a more positive action than just trouble shooting errors after they occur. Gen. Phillips stated that an assessment would be made today to determine whether the presently scheduled launch date would be confirmed and made public. ✓

VLF-37B GSE: GE, Daytona, expects to complete shipment of all of their ESE by 26 January with the possible exception of the backup batteries which may be a few days late. GE expects to ship the DDAS and countclock by 1 February and complete installation and checkout by 26 February. The mechanical GSE appears to be on schedule for 1 February completion with the exception of the IU coolant unit which should be delivered by 7 February. ✓

S-IB-4: A long duration static firing was conducted Friday. Engine No. 3's hydraulic actuator was leaking so this engine was locked in position and did not gimbal during testing; otherwise, quick look data indicates a satisfactory test. The non-gimbaling is not considered a problem which would require further static testing. The stage will be shipped to Michoud about January 31. ✓

IU DESIGN REVIEW: (Reference: James Notes 1/10/66 - copy attached.) Headquarters has unofficially accepted our recommendation to have this review on March 15 instead of February 24. We expect confirmation by the end of this week. ✓

NS 1/24

B 1/29

1. Manufacturing Efforts for S-II Insulation:

a. Repair of insulation at MTF: The progress of repair of the -T Stage at MTF, monitored and supported by ME personnel, is satisfactory. Procedures and techniques for repair were established, applied to the Stage and the known defects repaired. A pressure test and visual inspection were performed last week, revealing some additional defects consisting of one major and seven minor debond areas and a number of pinholes. It is anticipated that the repair of these defects will have been completed over the last weekend.

b. Manufacturing of 1.6" insulation panels at Downey: The subcontractor for S&ID (Aldren Plastics Corporation) did not deliver insulation panels in a quality as desired (it was probably the lowest bidder). Also, specifications for testing of these panels were not firmly established and were changed after delivery. The Company finally went broke on this venture. In order to overcome these problems and to prevent further schedule impacts, S&ID has now set up a shop at Downey for manufacture of these insulation components. Within three weeks they were in full operation producing acceptable panels and other insulation components under their own quality control. This action represents a very effective response to a critical situation and reflects very favorably on the new company spirit at S&ID. I was much impressed at my visit at L.A. last week by such visible improvement of efforts.

2. Welding Conference: The ME Laboratory sponsored a Welding Development Conference last week at the Morris Auditorium. At this conference eight companies and technical institutes, having study and development contracts on specific welding problems from MSFC, reported on their work and progress of their studies. Registered attendees numbered 110, representing industry, educational institutions, NASA Centers, prime contractors, Air Force, and the Army. The dissemination of new experience and learning from SR&T efforts sponsored by MSFC will, we hope, contribute to improvements in welding techniques at our prime and subcontractors.

B 1/29

9TB 1/24

1. MSF REVIEW OF POP 66-1 - The review, by Tom Newman of Apollo Program Control, of MSFC's POP 66-1 which had been scheduled for February 2 and 3 has been rescheduled for January 31 and February 1. This change results from General Phillips' decision to review MSFC's submission on February 8 at MSFC. General Phillips had previously not planned to conduct such a review. ✓

2. OSSA PROSPECTUS 1965 - We are in receipt of a copy of the OSSA Prospectus dated October 1965. We have reviewed this document and we are preparing a short written summary for you of the aspects of direct interest to MSFC. Specifically: OSSA participation in the MSF Program, the projected OSSA use of Saturn launch vehicles and new launch vehicle developments being considered. ✓

3. WASHINGTON PRESENTATION - NOMATIC -
(NOMographic Aid To Incentive Contracting) - Through General Bogart we are being placed on Dr. Mueller's calendar for a late February presentation on NOMATIC. Attendees will include General Phillips, Paul Cotton and Colonel Seccomb. ✓

During the Staff Luncheon on January 31 this same presentation will be conducted for your review. ✓

URGENT

Haus Maus

Please make sure that a "home for continued static testing of STI stages" becomes an officially recognized part of the program. I consider this absolutely vital.

B

Notes 1-24-66 MR. RICHARD

JS 1/24

No submission this week.

B 1/29

NOTES 1/24/66 RUDOLPH

NS 1/24

B1/29

Negative Report

8/1/24

1. MISSION OPERATIONS OFFICE: The office has been in operation for 6 months. The following summarizes our present status and first accomplishments:

a. Staffing: Our FY 66 staffing is complete with 33 personnel on-board plus 2 co-located Program Office representatives. We occupy part of the 3rd floor of 4202. Contractor support of our activities in Huntsville and Houston is nearing completion. Resident R&DO Lab support at Houston has not yet reached the planned strength of four. ✓

b. LIEF/HOSC: The Huntsville Operations Support Center (HOSC) has progressed from an empty building to an equipped facility during the past six months. Communications systems are essentially completed and checked out, while the display system is in checkout. The HOSC will basically be operational to support the AS-201 launch, although the display system will not achieve full capability until AS-202. AS-201 will also see the first operational mission tie-in to the Mission Control Center - Houston on a training basis, and the first joint MSC/MSFC wind simulations. Preparations for AS-201 LIEF operations have represented a major man power effort. This effort is headed by F. Kurtz. ✓

c. Mission Planning and Operations Documentation: MSFC inputs to IB Launch and Flight Mission Rules have been prepared and coordinated with KSC and MSC. Major progress was made in definition of flight control of the LH2 experiment, including assignment of the Flight Director's LH2 Experiment Representative (Mr. Platt, R-P&VE). The MSFC role in MSF mission operations has been clarified in many respects and documented in the MSFC Apollo/Saturn Program Operations Plan, now ready for your signature. Required inputs to and reviews of operations documents have been accomplished essentially on schedule. We are actively monitoring the operations aspects of AAP. This effort is also headed by F. Kurtz. ✓

d. Flight Control Office at MSC: Extensive planning of all flight controller activities has been completed for the early IB missions. Specific flight controller requirements have been issued and have aided in configuring the Mission Control Center and the MSF network for the Saturn vehicle. The initial MSFC flight control team for AS-201 was selected, qualified, and will be deployed in an active role. The qualification involved over 100 hrs of class work and over 60 hrs of simulated mission training. The 201 abort criteria were defined and Center agreement reached. This effort is headed by C. Casey. ✓

e. Operations Support Requirements: Program Support Requirements Documents for IB and V have been published. The 201 requirements are now being updated through the Launch/Flight Support Teams. Response channels within MSFC and to our prime contractors have been firmly established. IB and V ground network support plans for each mission are being coordinated with MSC and issued by this office. We are getting better visibility of our requirements within MSF and OTDA. This effort is headed by H. Golden. ✓

Operations Support Requirements Office in MSF
f. OSRO: W. Hynes has been assigned as the MSFC representative and has represented us in generating requirements documents for IB and V. OSRO is still experiencing various kinds of difficulties. However, the situation is slowly improving. The presence of our representative at Headquarters has proven valuable. ✓

B1/29

9/28/24

1. PEGASUS: No significant change has occurred in the Pegasus satellites this week. ✓

2. AAP - EARTH ORBIT: Optical Technology Systems (OTS) six-week review meetings (Perkin-Elmer/Lockheed at Norwalk, Connecticut, and Chrysler/Kollsman/Sylvania at Plainview, Long Island, New York) were attended January 18 and 19 by Marshall representatives (ASTR and RPL) and other NASA personnel. E. J. Reinbolt, ASTR-R, is officially contract monitor for the two contracts. Chrysler appears to be better organized, although past experience might point to Perkin-Elmer for competence. CO₂ gas laser seems to be most promising for satellite transmission. Tests for diffraction-limited optics need development. In all cases, the numerous technological experiments studied by both contractors must be justified as satellite payloads, in lieu of simpler ground, airplane, balloon, or rocket testing. ✓

3. SUPPORTING RESEARCH AND DEVELOPMENT: MSF last week provided work unit approval on six of our high priority work units. This completed approvals of all of the work units which comprise our high priority program. The estimated cost of these six work units totaled \$725,000. At this time, we have received work unit approvals totaling \$15,635,000 with only \$8,650,000 of program authority. We are still, however, anticipating replacement of the \$800,000 which was temporarily withdrawn by Headquarters, which will give us a total program of \$9,450,000. ✓

4. ART/SRT AND SUPPORTING DEVELOPMENT FY-1966 PROGRAM STATUS:

	<u>Annual Plan</u>	<u>Program Authority</u>	<u>Processed To FMO</u>	<u>Obligated</u>
OART	16,264,000	15,764,000	9,691,633	2,528,252
MSF (904)	8,650,000*	8,650,000*	8,629,798**	2,913,404
OSSA	5,903,000	608,000	478,071	198,546
OTDA	<u>1,500,000</u>	<u>1,500,000</u>	<u>705,967</u>	<u>20,356</u>
TOTALS	32,317,000	26,522,000	19,505,469	5,660,558

* Reflects \$800,000 reduction effected by Headquarters.

** This includes \$1,570,380 processed without "Scope of Work" statements for the purpose of reserving Program Authority to protect our uncommitted Supporting Development funds. ✓

WILLIAMS NOTES 1-24-66

B 1/29

QIS 1/24

1. MISSION PLANNING TASK FORCE: The first meeting of the Lunar Surface Standard Reference Mission Working Group of the Mission Planning Task Force (MPTF) was held in the Research Projects conference room January 18, 1966. For the benefit of the MSC and MSF members of the MPTF, Mr. Gierow (R-RP) and Mr. Bradford (R-AS) reviewed a representative lunar surface mission and its associated mobility aids. The Chairman, Mr. D. Beattie (Headquarters), reviewed the purpose for establishing the group and asked that individuals in the group begin formulating constraints in their various areas. It is hoped that this action will point out inconsistencies which may exist between various elements comprising a lunar mission and corrective planning and action can then be taken. The next meeting is scheduled for early February 1966. ✓

2. LEM AND CSM PHASE "B" STUDIES: Final reports on the LEM Phase "B" studies have been received from Grumman and distributed at MSFC. A limited quantity of reports (Phase "B") on the NAA CSM studies have been received and distributed. We are making arrangements for Grumman to come to Huntsville in mid-February to brief us (a large group including possibly yourself and the lab directors, etc.) on their Phase "B" AAP work under the MSC contract. ✓

3. ED GRAY'S STAFF MEETING: As I mentioned last week, I spent Friday and Saturday with Ed Gray and his Senior Staff, Max Faget and Phil Clayborne (who will head up KSC's advanced study work) discussing: (1) AAP and Gray's involvement, (2) the Advanced Study program, and (3) the working relationships between Headquarters and the centers as well as inter-center relationships. All in all, it was an excellent get together and although no major problems were solved, they were flushed to the surface and objectively discussed, which helped very much. ✓ It was very evident that Gray and his people are pleased with ASO's attitude and posture with regards to his office and activities, but has many problems with MSC (as we do, although they are improving somewhat at present). ✓

January 31, 1966

NOTES 1/31/66 BALCH

B_{2/2}

RS 1/31

S-II-T - Completion of additional side wall insulation repairs, necessary as a result of proof pressure tests, is now delayed until next week because of bad weather. Final preparations are underway for the LN2 tanking tests, tentatively scheduled for mid-February. The following stage systems are essentially complete: Engine Servicing, Valve Actuation, Thermal Control, Hydrogen Recirculation, LOX Recirculation, Electrical Control and Power, Leak Detection and Purge, LH2 Overboard Bleed, LOX Overboard Bleed, and Propellant Feed System. This leaves the Pressurization and Instrumentation systems with open items against them. ✓

S-II Test Stand A-1 - Follow-up was made on extent of improvement in steel deliveries as a result of visit of MTF Site Manager and Corps of Engineers representative to Capitol Steel a few days ago. Three shipments of steel for the A-1 stand were made on 1/25/66, and it appears that improvement in deliveries will continue. ✓

S-IC Test Stand and TCC - The RCA 110A computer installation is essentially complete. Checkout and debugging began on 1/27/66. ✓

Technical Systems, Phase I - The data handling system in the DHC is now scheduled to be partially operational by 3/15/66 and fully operational by 5/30/66. ✓

Technical Systems, Phase II - Request for Quotation is being prepared on S-II Test Stand A-1 installation. Task packages have been prepared in draft form and will be ready for issuance to an installation contractor when selected. One-third Octave system installation in the DHC is scheduled to be complete by 2/1/66. ✓

High Pressure Gas Systems - All systems required to support gas systems electrical and mechanical operational testing were made available to S&ID on 1/28/66. ✓

Local Airport Situation - MTF representative attended meetings of both the Hancock County Board of Supervisors and Port and Harbor Authority and of the Picayune Airport Authority on their respective plans for commercial airports. ✓

9/8 1/31

H-1 ENGINE

Incentive contract negotiations for 22 additional H-1 rocket engines have been completed. ✓

The RFQ for 60 follow-on engines is in process at MSFC. Transmittal to Rocketdyne is expected during the first week of February. ✓

To date, 32 tests have been made on the first 3 specimens of the larger radii vented LOX shaft seals. This new seal had 22 vent holes drilled into the wave spring cavity. No leakage was evident on any of the tests. It is anticipated that the 3 specimens will have a total of 15 tests each by February 1. ✓

J-2 ENGINE

Negotiations for 52 deliverable J-2 engines were successfully completed on January 26, 1966. Settlement was within the Headquarters guidelines. Negotiations are proceeding on the Operational Development Support portion of the combined J-2 engine contract (NAS8-19). The final guidelines were received from MSF Tuesday, January 25, 1966.

The engine to be utilized for the AEDC altitude test program was accepted by the government and is enroute to AEDC. ✓

F-1 ENGINE

The fuel inlet ducts, commonly known as baby pants, were found to have surface cracks in an inside circumferential weld on engine 5029. Further inspection of other engines and spares indicated that most of these ducts contain similar cracks. This is in spite of vendor dye penetrant, X-ray inspection, and Rocketdyne receiving inspection. The engines in vehicles 501, 502, and 503 will have ducts replaced during routine preparation for static firing, with no stage schedule impact; however, it will require extra effort from Test, Qual, and ME Labs at MSFC. Collective action has been initiated to correct the quality control shortcomings which have been identified as the cause of this problem. ✓

RL-10 ENGINE

It has been determined that the first seven Surveyor vehicles need no more payload margin. This resulted from use of engineering model spacecraft and lengthening of the Atlas tanks. Discussions with Lewis, the Air Force and MSFC R&DO personnel suggest that emphasis on engine performance improvements should be replaced by effort toward increased flexibility. We are studying the possibility of combining throttleability, low idle capability, bootstrap pressurization, instant start, and low coast leakage, most of which have been demonstrated individually, into a prototype engine design which would serve as the basis for a common engine for NASA/DOD requirements. ✓

GENERAL

The UAW and Rocketdyne failed to reach an agreement on the EAFB contract in a last ditch meeting on Saturday; consequently, the union went on strike this morning. Contrary to a previous agreement, the union is picketing all gates to Edwards. ✓

B2/2

1/31/68

1. S-IVB APS TEST STARTED AT MSFC: The Saturn IB/S-IVB APS was fired at simulated altitude conditions (70,000 - 110,000 ft.) for the first time on 1-26-66. Preliminary data indicated satisfactory operation.

Karl Heinberg

I'd like to attend such a test. Please arrange thru Bonnie.

noted.
B2/2

B2/2

JS 1/31

B
2/2

1. Data Management

Operation Papermill - "Operation Papermill" has logged to date 107 suggestions. An analysis of the initial 67 inputs is as follows:

MSFC forms and procedures	18%
Combination or elimination of reports or other documents	17%
Combination or elimination of MSFC Star and Weekly Bulletin	15%
MSFC distribution practices	13%
Miscellaneous and not strictly identifiable category	37%

In accordance with these inputs it is particularly proposed to combine separate documents presently issued and maintained by separate offices into one MSFC issue, such as the Configuration Manuals Saturn IB and V. Both documents are almost mirror images and could be combined into a single document. ✓

First Article Configuration Inspection (FACI) - IO and R&DO representatives jointly agreed to rewrite the proposed Saturn V Operating Procedure HR 5-300: "Preparation for FACI"; this procedure will recognize R-QUAL as the R&DO FACI coordinator in accordance with R-DIR's policy. The concepts covered by the procedure should also apply to Saturn IB, and I-RM-C Configuration Management Office was requested to review. ✓

2. Change Coordination Office

The CCO processed 700 ECP's (Engineering Change Proposals) and associated documentation during 1965.

Seven Configuration Control Boards (CCB's) utilize the CCO for the technical evaluation of ECP's (Engineering Change Proposals). Implementation for the remaining 3 CCB's is underway.

A numbering system for Engineering Change Requests (ECR's) will be implemented shortly. The CCO will assign ECR numbers as requested by the laboratories. ✓

3. Boilerplate Command Modules (BP's)

Two BP's previously used by MSC as ground test vehicles at NAA and White Sands may become available. MSFC has requested transfer of both BP's since R-ME proposed their utilization in connection with AAP (Workshop) programs. ✓

4. Apollo Joint Operations Group (JOG)

Headquarters has discontinued JOG; the responsibility for the functions of the working group are transferred from the PRB to the Apollo Program Director, who has established the Operations Management Group and the Operations Executive Group for the continuation of these activities. ✓

NOTES 1/31/66 FELLOWS

B_{2/2}

1/31

R&DO General Support of the Apollo Program: We have been working closely with Executive Staff and Financial Management Office personnel to identify fund sources and establish a system which will provide for the accounting and fund control of R&DO effort in general support of the mainstream Apollo Program. This work is continuing and is expected to be used in the packaging of a "Program Development Plan" for internal MSFC use in accordance with the instructions of January 28 issued by Mr. Gorman. ✓

9581/31

1. S-IC-2 CHECKOUT: Mechanical and electrical status checks have been completed and continuity checks are in progress so far as possible. The Laboratory Test Complex, which had been down for Change Action Memorandum (CAMS) kit installation, has been powered up again, GSE connected to the ground equipment test sets and the vehicle simulator, and test procedure verification is in progress. ✓
2. S-IVB PROGRAM: The S-IVB 202 stage is in transit to KSC and expected to arrive 1-31-66. S-IVB 203 is undergoing prestatic checkout at Sacramento. Expected firing date remains 2-9-66. S-IVB 204 is in the Beta III test stand at Sacramento undergoing preparation for test firing. S-IVB 501 is in manufacturing checkout at Huntington Beach. Plans are to cease checkout operations on February 4, 1966. There are presently approximately 5,000 hours of manufacturing effort open, involving 250 assembly outlines (AO's) and about 250 part shortages. Unreleased engineering will result in approximately another 1100 manufacturing hours. ✓
3. S-II PROGRAM: We have initiated surveys of S&ID critical hardware vendors. We will accompany S&ID to 43 companies and together evaluate the quality controls applied against some 85 critical items. This is an effort to identify and correct problems with hardware before it is delivered to S&ID. We expect to complete this job before March. ✓
4. INTEGRATED CIRCUIT TESTING: This Laboratory's capability in testing and evaluation of integrated circuits has increased with the receipt of equipment from Texas Instrument Company which will perform dynamic as well as static tests of 20 lead devices. It can also test transistors, diodes, and printed circuit modules and perform limited tests on amplifiers in the integrated circuit and modular category. The system can be expanded to test 40, 60, and 80 lead devices and is adaptable to computer control and data logging. The static test basically consists of voltage, current and differential measurements. Dynamic tests are basically time, peak voltage, pulse width and other tests which would normally be made with a scope. The system is completely tape programmed and has capability of self checkout. ✓
5. RCA-110A COMMITTEE: A committee has been established to investigate the possibility that cracked solder joints of component leads on printed circuit boards may be causing the parity errors in the RCA-110A computers at LC-34, and to develop a suitable repair technique. Temperature cycling between 0°C and 50°C on two test boards has resulted in stress lines, noted before testing, developing into cracks plus a high rate of component failures. The two test boards have experienced a total of five component failures in a maximum of five temperature cycles. A technique for repair and prevention of cracked soldering has been proposed; however, this may be only part of the solution since in addition to solder joint failure, component failures seem to be significant. Selectivity of components such as transistors and diodes, may be necessary for higher dependability. ✓

1. RCA-110A PARITY ERRORS: Investigation by RCA of the causes of 110A computer systems parity errors at VLF 34 has revealed that the probable remaining cause of errors is fractured solder joints on module boards. All other equipment causes have been removed by RCA at VLF 34. A proposed plan for VLF 34 rework of fractured solder joints will be transmitted to MSFC on 2/1. Tentative plans for an immediate interim fix involving the exchange of printed circuit logic boards between the Astrionics Laboratory computer and the AGCS computer at VLF 34 were set aside after discussions with Dr. Gruene. Although this exchange of boards looked attractive from the standpoint of alleviation of the parity error problem, it was decided that other risk factors outweighed the possible advantages. In accordance with MSFC's previous request, RCA will maintain 24-hour around-the-clock technical representative coverage at VLF 34 through the AS-201 launch, in addition to maintaining at KSC a design engineer to monitor, assist, and provide design engineering coverage for VLF 34 operations. ✓

2. SA-203 IU TV AND TM ANTENNAE: The original design of TV and TM antennae for SA-203 IU did not, according to test results performed on prototype, meet requirements for bandwidth. As a consequence, the original design had to be dropped. A prototype of a redesigned unit is being tested. Flight units of this new design will be delivered to IBM 2/14, still satisfactory for start of checkout. Full qualification will be completed 3/31. ✓

3. EMERGENCY DETECTION SYSTEM: Presentation of 1/13 to Dr. Rees concluded with the following agreements: (a) CCSD will perform Saturn V EDS component testing (b) Sequence Controller will be ordered for testing under the EDS program. (c) Astrionics will request Saturn V Test Office for EDS Contact. (e) It was agreed that completion of Qualification Phase of EDS Testing Program was mandatory before the first manned flight. We have a very tight schedule for EDS testing. Procurement of items that are to be tested under the Saturn V EDS program have been initiated. ✓

4. SPIN GYRO PROJECT: The cryogenic superconductive gyro review at GE, Schenectady, covered the Mark II model, which has been designed and partially manufactured for accuracy testing on a gyro precision test stand. Test results can be expected in about 6 months. ✓

958 1/31

S-IC

The S-IC-1 stage was installed on January 24, 1966. The stage checkouts began on Friday. The propellant load test is scheduled for February 4, 1966. ✓

S-IVB-2003

Pre-static checkout is progressing slowly due to problems involved in proofing automatic procedure tapes. The propulsion sub-system automatic test was completed January 27, 1966. The integrated system test will probably be run January 31, 1966. The overall schedule is much tighter, indicating a direct correlation between slippage in pre-static checkout and firing date (still scheduled for February 9, 1966). ✓

S-IVB-2004

Vehicle 2004 checkout is on schedule for a static firing date of about March 15, 1966. Propulsion sub-system checkout is due to begin in mid-February. ✓

S-11 BATTLESHIP (SANTA SUSANA)

The A7-71 LH₂ heat exchanger was delivered from Linde on January 24, 1966. (This unit is identical to the unit tested in Test Laboratory.) The unit installation is not expected to be ready for Test 028. The special LH₂ tanking to test the LH₂ recirculation system was scheduled for January 22, 1966; however, the annular space fine vacuum pump failure caused the test to slip until a new pump could be installed. The test has been further delayed due to problems experienced with achieving the valve can vacuums. Test duration of Test 028 scheduled for February 1, 1966, has been changed from 200 seconds to full duration (390 seconds). The prime objectives of this test include a demonstration of engine actuation system, four engine gimbaling with increased amplitude, PU/PMR, and L02 low level sensor cutoff systems. Method of preconditioning fuel side will depend on results of the special LH₂ recirculation test. ✓

S-IVB (MSFC)

Test S-IVB-013 was run for 100.5 seconds Monday, January 24, 1966. A check valve was installed in the fuel recirculation line to perform a dry fuel feed duct recirculation test. Test S-IVB-014 was run for 438 seconds January 26, 1966. Acquisition of parts for chilldown system rework continued. Periodic inspection of the turbopump on Engine J-2027 was begun January 27, 1966. It is estimated that the inspection will be completed early on January 31, 1966. ✓

SUPER INSULATION TESTS

A 105" diameter tank insulated with NRC-2 super insulation was tested in the high vacuum chamber using LH₂. The vacuum chamber was held at 2.5×10^{-5} mm Hg for the 72 hour test. ✓

S-IB AUXILIARY PROPULSION TESTING

The S-IB/S-IVB Auxiliary Propulsion System Module was successfully operated through a limited duty cycle at a simulated altitude ranging from 60,000 to 110,000 feet. Testing was successful and module operated as expected. ✓

NOTES 1-31-66 HOELZER

B_{2/2}

Negative Report

B 2/2

NOTES 1/31/66 JAMES

958/31

AS-201: The overall plugs out test was run Wednesday, January 26. Numerous problems were encountered and the test was not completed until early Thursday morning, January 27. A low level of confidence existed in this test because of the many difficulties experienced. Over the weekend it was decided to rerun the overall plugs out test tomorrow and, pending a successful test, proceed with the countdown demonstration test starting Thursday, February 3. I plan to go to KSC for the CDDT. (COUNT DOWN Demonstration Test) ✓

IU SCHEDULE STATUS: As a follow-up on the previously identified IU delivery problems, we had a meeting with IBM (including Art Cooper) to review in detail their plans to improve the schedule picture. This meeting was a joint Saturn IB and Saturn V effort. An encouraging picture was presented with delivery schedules which more nearly support our current launches. A two-week problem still exists for IU-203, but this is a considerable improvement over the IBM previous projection of a six-week problem. We will continue to work the two-week problem. ✓

I think all of us realize that merely changing the schedules on paper to look good doesn't solve the problem; however, due to the planning data as well as the attitude displayed by IBM, there is some indication that they finally are approaching the problem with the degree of urgency it requires. We will continue to watch this one very closely. ✓

DAC MANPOWER AT KSC: During your recent visit to DAC, I understand that they indicated to you that an MSFC monthly manhour limitation was hampering their ability to perform at the level they and KSC felt was necessary at the launch site. We have been working very closely with KSC on this matter and the indicated restrictions have been relaxed to KSC's satisfaction. DAC's manning estimates have always been higher than either MSFC or KSC estimates. They are also higher than any of our other contractors at KSC. I plan to go to KSC for the AS-201 countdown demonstration test this week and will discuss this matter with KSC in an effort to finalize our position with them so that they can proceed with negotiations on their contract supplement with DAC. ✓

S-IVB INFLIGHT BULKHEAD FAILURE TEST: While at DAC, you also questioned whether adequate instrumentation is being planned to make the inflight bulkhead failure test on S-IVB-202 a worthwhile test. I understand redundant instrumentation is available and both DAC and R&DO are satisfied with this instrumentation. ✓

9581/31

Utilization of Bonding Facilities:

a. The new Autoclave is presently undergoing final acceptance testing and should be available for beneficial occupancy in about two weeks. A test program to manufacture and test large aluminum honeycomb panels has been established and coordinated between this Laboratory and P&VE Laboratory (Structural Division). Quality Laboratory is also participating in this program. Material and tooling intended to be used for the Centaur shroud program will be utilized. ✓

b. Mr. M. A. Faget, MSC, Houston, has requested in a letter to Mr. Weidner, that an overpressure test of the flight acceleration facility gondola vacuum caps be conducted by Marshall Center utilizing our new Autoclave. These gondola vacuum caps consist of two spherical segments, approximately 12' diameter, which are of honeycomb sandwich construction. We are requested to design and fabricate the test fixture and buffer structure (inside), to instrument the vacuum caps with strain gages, to conduct the test, and to record all data. The gondola caps will be available for this by the middle of April. Mr. Franklin is preparing our technical and cost proposal for this task which is due February 1. ✓

B₄₂

NS 1/31

1. MSFC POP 66-1 - Dr. Rees and Mr. Gorman conducted a comprehensive review of POP 66-1 on January 28. Special emphasis was placed on the justification of FY 66 requirements for Apollo with a view toward preventing any cut in funding by MSF. POP 66-1 now in the final stages of preparation has been revised to show hard core requirements in FY 66 and the best estimate of requirements for FY 67. These requirements equal or exceed the values shown in MSF POP 65-4.

The attached chart summarizes a comparison of our POP 65-4 and MSF POP 65-4 to our POP 66-1 for Manned Space Flight.

The review by Tom Newman from Apollo Program Control of MSFC's POP 66-1 is now scheduled for Wednesday, February 2. General Phillips is tentatively scheduled for a visit on February 8 for a formal review. Dr. Mueller will review the MSF position with you and other center directors on February 16.

The chances for avoiding a cut in FY 66 funding hinge upon our ability to convince MSF of the realism in our cost plans and the need for our stated level of uncosted funds (unfilled orders) at the end of the year. ✓

2. WEATHER BUREAU PROBABLE CUSTOMERS - Joe Reed met with Dr. Kuettner at his Weather Bureau office in Suitland, Maryland, January 21. He learned that:

a. A letter is now being prepared by Dr. Kuettner to go to Mr. Robert M. White, who is the Administrator of the Environmental Science Services Administration, for transmittal to Dr. Seamans. This letter will say to Dr. Seamans: "May we please deal directly with the Manned Space Flight Center and the Marshall Space Flight Center, and discuss our mutual work interests in Apollo at the site in Houston and Huntsville." ✓

b. At the present time, the ESSA operation is directing its efforts to preparing a broad space program. The preparation is being made in response to the direct request of the Secretary of Commerce, and will be presented to him by Dr. White, Dr. Kuettner, and others sometime before the end of April, 1966. ✓

c. Dr. Kuettner wanted somehow to get a message to you so that you would become concerned with actuating Dr. Mueller and Dr. Seamans to the theme, "Let's get in communications with the customer." ✓

MSF R&D FUNDING COMPARISON
(APOLLO)
(DOLLARS IN MILLIONS)

	FY-66				FY-67			
	MSFC POP 65-4	MSF POP 65-4	Δ	MSFC POP 66-1	MSFC POP 65-4	MSF POP 65-4	Δ	MSFC POP 66-1
APOLLO	1,592.4	1,537.4	+4.4	1,541.8	1,514.8	1,432.5	+72.6	1,505.1
SATURN I	.5	.5	0	.5	-	-	-	-
SATURN IB	255.9	248.5	+1.6	250.1	220.3	189.9	+25.6	215.5
SATURN V	1,187.4	1,144.7	0	1,144.7	1,159.7	1,117.0	+42.7	1,159.7
ENGINES	148.6	143.7	+2.8	146.5	134.8	125.6	+ 4.3	129.9
BETSY	7.0	-	+3.7	3.7	-	-	-	-
SUPPORTING DEV.	23.9	11.5	0	11.5	40.0	10.0	+10.0	20.0
ADVANCED STUDIES	5.5	5.5	0	5.5	10.0	5.5	+ 3.8	9.3
IN-FLIGHT EXPERIMENTS	10.3	-	0	0	22.8	22.8 O	+4.2 + 27.0	27.0 27.0
TOTAL	1,639.1	1,554.4	+8.1	1,562.5	1,587.6	1,470.3 1,448.0	+90.6 +113.4	1,561.4

E-R January 27, 1966

NOTES - 1/31/66 - RICHARD

B 42

NS 1/31

SA-201 Launch Preparation: Because of the large number of problems across the system, KSC is rerunning the plugs-out overall test on Tuesday, Feb. 1. We will witness this test and talk to the KSC people to try to improve our communications. Parties of both centers have expressed concern about the exchange of detailed technical information, and we must improve this situation. ✓

Saturn V 501 Prelaunch Test and Checkout Requirements: A preliminary Saturn V 501 Prelaunch Test and Checkout Requirements document has been released to I-V-T. This document, as is, is not satisfactory to this office and is presently being reworked for re-release next week. ✓

SA-204 and SA-504 Specifications: The Technical Systems Council is finishing its efforts on these two documents and they will be released on Feb. 7 and Feb. 18, 1966. We are still somewhat "after the fact" in this kind of effort, but we are gaining ground. ✓

9/13/1

1. SA-501 Interface Control Documents (ICD's) - The major portion of SA-501 ICD's are in technical coordination with stage contractors. An estimated 50% are on contract. The final SA-501 ICD baseline definition is expected to be received from R&DO (Mr. Dannenberg) on Wednesday, 2 February 66. Complete contractual implementation is expected by Tuesday, 1 March 66. ✓
2. S-IC-1 Stage - Moved from R-MB to R-TEST on Monday, 24 January 66, as scheduled. First captive firing expected Thursday, 24 February 66. ✓
3. S-II Battleship Stage - Reference Notes 1/17/66 Rudolph (copy attached). LH₂ Recirculation Tests were conducted last week (January 24-28, 1966) in an effort to determine cause of the unsatisfactory performance during the 12 January 66 firing.

- Two LH₂ recirculation pumps which malfunctioned during the 12 January 66 firing were returned to the vendor for evaluation. Evaluation not complete, however, already known that one bearing failed. ✓

- No definite solution to the recirculation problem known at this time. ✓

- 26 January 1966 scheduled firing postponed to allow activation of the stage propellant utilization (PU) system. ✓

- PU system activated and a 200 second plus firing is scheduled for 1 February 66. ✓

4. S-IVB Common Bulkhead Failure:

- The S-IVB common bulkhead test article failed during reverse differential (crushing) pressure testing.

- Maximum negative (reverse) differential pressure attained during the test was 33.1 psi. The pressure requirement for the ultimate condition is 43.7 psi (1.4 times the limit differential pressure of 31.2 psi).

- Evaluation of the test failure is in process. ✓

- No impact on flight stage schedules is anticipated. ✓

Attachment: Notes 1/17/66 Rudolph (DIR, I-DIR & R-DIR's copy only)

1. AS-201 LIEF TESTS: Operations personnel training and simulation exercises were held during the Plugs-In and Plugs-Out tests on January 23 and 26 respectively. Personnel location service was also made available to KSC during both tests. Data transmission between KSC and MSFC was accomplished after overcoming initial difficulties. Voice checks and voice procedures training were accomplished with the L/V flight controllers in MCC-H Houston for both tests. ✓
2. WIND MONITORING: Preparations are being made to conduct a full wind monitoring exercise during the AS-201 Countdown Demonstration Test (CDDT). Wind data will be transmitted by KSC as scheduled for launch countdown but will include artificial wind profiles to test our ability to quickly detect marginal launch conditions. ✓
3. REVIEW OF AS-201 MANDATORY ITEMS: As a result of the Flight Readiness Review we reviewed the AS-201 mandatory items with Col. James. The review resulted in some adjustments in the MSFC requirement. A major change was made in photographic requirements by dropping optical coverage of the max q period from Mandatory to Highly Desirable. It appears that KSC has conflicting information on MSFC "Redline Parameters". The IB Program Office is transmitting updated parameters for the CDDT and we will firm up launch parameters after the CDDT. P&VE is putting a major effort into clearing up this problem. ✓
4. AS-201 OPERATIONS SUPPORT REQUIREMENTS: A meeting was held at KSC to review ground support for AS-201. We (as well as MSC) are generally satisfied with the response to our requirements. The support is not as complete as desired but is adequate. A few problems still exist such as: C-band radar coverage utilizing the S/C beacon may not meet MSFC metric requirements; lack of minor photographic items; and the lack of optimum telemetry coverage from Antigua. All problems, except for Antigua, will be resolved before launch. We have requested to make tracking of the L/V C-band beacon Mandatory in view of the troubles with the S/C beacon. ✓
5. NETWORK STATUS: We participated in a briefing by OTDA and GSFC to Gen. Phillips in Washington on the status of the Manned Space Flight Network. In general the Unified S-Band (USB) station implementation is progressing as scheduled with the network to full capacity for supporting a manned mission by AS-504, with the exception of Canary Island. Launch vehicle requirements on the USB network for flights prior to AS-504 will be satisfactorily met with one possible exception, Ascension support for providing evaluation data after S-IVB second burn and for testing of the Command Communications System (CCS) on AS-501 and AS-502. Present indications are Ascension will be ready, too. ✓
6. FLIGHT CONTROL STRUCTURAL DISPLAY FOR AS-201: A meeting was held here on January 27 upon request by MSC Flight Operations personnel on structural breakup data for the AS-201 Flight Dynamics Officer (FIDO) displays. It had been previously agreed that pending structural breakup would not be an AS-201 FIDO abort criteria, so the display requested was for information only. It was concluded, based upon opinions from R&DO personnel attending, that the substantial priority effort required to generate the data for AS-201 is not justified, and MSFC will not satisfy the MSC request. ✓

1. PEGASUS: No significant changes. ✓
2. VOICE BROADCAST PROPOSAL EVALUATION: A representative of RPL, together with representatives from ASO and ASTR, will go to Headquarters this week to assist in the evaluation of proposals for the Voice Broadcasting System. MSFC was requested to participate in this effort by a letter from Dr. Newell. ✓
3. FY-67 SRT PROGRAM MEETING: The Research Program Office of RPL held a meeting on January 26th for the purpose of reviewing guidelines and requirements for the FY-67 SRT Program. This meeting was attended by approximately 40 R&DO laboratory representatives. Information presented during this meeting will be included in the FY-67 call letter which is currently being prepared and which will be distributed upon receipt of the official guideline information from OART. This information has already been provided by OMSF and OSSA. Present planning requires that the laboratory submissions reach this office by March 15th. This meeting was also attended by Mr. Norman Peil from MSF. ✓

4. ART/SRT AND SUPPORTING DEVELOPMENT FY-1966 PROGRAM STATUS:

	<u>Annual Plan</u>	<u>Program Authority</u>	<u>Processed To FMO</u>	<u>Obligated</u>
OART	16,264,000	15,764,000	10,713,730	2,886,481
MSF (904)	8,650,000*	8,650,000*	8,647,497**	2,918,718
OSSA	5,903,000	608,000	478,071	198,921
OTDA	1,500,000	1,500,000	705,967	20,356
TOTALS	32,317,000	26,522,000	19,505,469	5,660,558

* Reflects \$800,000 reduction effected by Headquarters.

** This includes \$1,395,380 processed without "Scope of Work" statements for the purpose of reserving Program Authority to protect our uncommitted Supporting Development funds. ✓

5. AIAA ACTIVITIES: During the Second Annual AIAA Meeting last week, my three-year period as AIAA Technical Director terminated. However, I was requested to serve as program coordinator and organizer for the theme "Propulsion" at the Third Annual AIAA Meeting in December, 1966. ✓

NOTES 1/31/66 WILLIAMS

Q/S 1/31

B_{2/2}

No Notes.

9/8/31

B2/2

SPECIAL PUBLIC INFORMATION PROGRAM FOR THE BLIND

A special public information program has been developed by MSFC/Michoud for the Lighthouse for the Blind in New Orleans. A series of oral presentations using the 1/96 scale models of the Saturn vehicles, which can be handled and touched by the blind, will soon be instituted. In addition, Michoud is in the process of having a booklet printed in braille for the Lighthouse covering NASA/MSFC/Michoud, the Saturn rocket and project Apollo. Also, we have had the Lighthouse added to the NASA Headquarters radio tape distribution list. This program is being developed as a "package," that can be offered to both public and private institutions for the blind throughout the State of Louisiana. We are advised that there are some 700 blind people in New Orleans. This innovation of our Public Affairs Office is believed to be the first time that a comprehensive program of this magnitude has been developed for the blind.

Harry G.

Suggest we introduce same program in Huntsville
B

(send copy to
Slattery

cy sent
2-16-66

1/20/66